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ORIGINAL ARTICLES.

HYDRONEPHROSIS.

AN ESSAY BASED UPON THE COMPARATIVE STUDY OF SEVENTY-ONE CASES OF THAT LESION, OF WHICH ONE CASE CAME UNDER THE PERSONAL OBSERVATION OF THE WRITER.

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When the urine accumulates slowly in the kidneys, either because of some obstacle in the ureter or by reason of some malformation of the parts it occasionally happens that the calyces and pelvis renalis become dilated without perceptible inflammation of their walls: urinous or serous fluids collected in such a way, with their consequent lesions, are now known as hydronephrosis.[1]

Since the latter part of the 17th century this affection has been described under different names: first, by Rudolph and Franz, as hydrops renalis, then by Ruysch as expansis renum or hernia renalis, later by Johnson as hydrounal distension, still later by Rayer as hydronephrose.

The old anatomist Ruysch first had his attention called to this lesion through an anomaly observed while dissecting the kidneys of a sheep: so far as I know this is the earliest case on record, and perhaps, historically considered, worth translation from its monkish Latin.

"Nearly two years ago that diligent surgeon and anatomist, Vogelsaugh, at a dissection showed us two kidneys of a sheep so stretched and filled with a watery fluid that each kidney could hold nearly two pints. The ureters were tortuous, and of such capacity that they would admit a large carrot root. Each end of the swollen kidneys had not lost its natural glandular structure, but the space between was composed of membrane. The tubuli pelvis were great sacs of such size that each would admit an acorn stripped of its green cup. By easy manipulation I could force the urine in the bladder toward the ureter and kidneys, but not from the ureter and kidneys to the bladder, except by a strong effort, very sparingly, through a little foramen in the middle of a septum I found between the bladder and ureters. From this cause arose a regurgitation of urine, and in course of time such a large expansion of the kidneys and ureters."[1]

Bonetus (Sepulcretum, Genevæ, 1700) also makes mention of similar cases that were mistaken for hydrovaria; on page 571, Vol. II, he says: "Sometimes not only serum is derived from the kidneys by the emulgents, but even serous and mucous material; when this stays in the pelvis it becomes sandy; when it stays in the emulgent veins, because of its coarseness, a mass is formed shaped like a butterfly, having symmetrical wings and feet." This phenomenon he actually observed at an autopsy made on the Duchess of Ferrara, who appears to have suffered from hydronephrosis. A case of this lesion diagnosed during life as swollen spleen is related in the same volume, as well as probably the first congenital case on record, where the right kidney was enormously swollen, but unaltered in its general conformation.

[2]Rayer was the first writer to give an extended and exhaustive account of this affection; since the publication of his work several writers, Johnson,[3] Vogel,[4] Rosenstein,[5] Roberts,[6] Ebstein,[7] Todd,[8] Lecorché,[9] and especially Simon,[10] in a work that has never been placed before the profession in this country, have added much to our knowledge and treatment of this comparatively rare lesion. Nor in this connection should the writer omit to mention the monographs of such men as Cooper Rose,[11] C. J. Hare,[12] Krause,[13] Hildebrandt,[14] Gusserow,[15] Saexinger,[16] Ackermann,[17]

[1] Centuria anatomico-chirurgicanum Observationum Frederici Ruyschii. Observatæ XCIX.

[2] Maladies des Reins—Tome troiseim, §829, par M. P. Rayer.

[3] Treatise on Kidney Diseases. Lond. 1852. [4] On same by Vogel (1865.)

[5] Traitui Pratique des Maladies des Reins, par S. Rosenstein, tratuit par les Docteurs E. Bottentat et F. Labadie-Lagrave.

[6] Urinary and Renal Diseases, by William Roberts, M.D.

[7] Kidney Diseases, by Prof. W. Ebstein in Zeimzsin's Enclyclopædia, Vol. XV.

[8] Todd, Clinical Lectures Page 389.

[9] Lecorchē, Maladies des Reins.

[10] Chirurgie der Nieren. Theil II, von Dr. G. Simon.

[11] *Medical Times*, 1868.

[12] *Medical Times*, 1857, Vol. I.

[13] Langenbeck's Archiv., VII, 6. Ein Fall von Hydronephrose u. s. w., von Dr. W. Krause.

[14] Volkmann's Vorträge, Nr. V. Ueber Retroflexion des Uterus, von Dr. Hildebrandt.

[15] Ibid, Nr. XVIII. Ueber Carcinoma Uteri, von Dr. A. Gusserow.

[16] Vierteljahrschrift für die Praktische Heilkunde (Prag), Nr. XCIII. Ueber Uterus Krankheiten, von Dr. Saexinger.

[17] Deutsches Archiv. für klinische Medicin, Heft III und IV. Atrosie beider Harnleiter u. s. w., von Dr Th. Ackermann.

[1a] "Die Hydronephrose enthält im Gegensatze zur Phronephrose nur eine seröse Flüssigkeit, etwa verdünnten Urin, aber kein Eiter." Ultzmann. Real Encyclopädie der Gesammten Heilkunde. Band VI, p. 662.

[1] "On désign sons le nom d'hydronéphrose un état morbide, indépendant d'inflammation," etc. Lecorché—Traité des Maladies des Reins. p. 624.

Hotz,[1] Rosenberger,[2] Labadie-Lagrave,[3] Lanceraux,[4] Fenger[5] and others, that have aided much in the elucidation of this important subject and from which most of this paper has been gleaned.

Hydronephrosis may be either congenital or acquired; of the former variety little need be said here except that it is frequently associated with atresia ani, club-foot, hare-lip, and other malformations, and that where it is double the neonatus is never viable. The ætiology of the latter kind embraces a great variety of causes.

Of such factors may be mentioned calculi or hydatides in the urinary passages, thickening or swelling of the walls of these passages, prolonged or habitual retention of urine in the bladder: these causes, it must be remembered also, are rendered especially operative in females by reason of the anatomical peculiarities of their pelvic organs.

This interesting point is thus ably discussed by Prof. Hildebrandt,[6] whose remarks, with account of cases, I translate: "The connection of an hydronephrosis with a primary disorder will appear clearly if we consider the anatomical seat of the ureters. The ureters take a course on the right and left side next to the portio supra-vaginalis uteri. If now the middle portion of the uterus is angularly bent it is easily seen that both ureters will bend with it and will be pulled down from behind. Then the urine necessarily stagnates on its way to the bladder above the bend; it distends the ureter and the stagnation continues yet farther up to the basin of the kidney. . . . This connection between retroflexion and distension of the ureters was shown even more clearly in a case sent to me from B—— a few months ago.

Mrs. H——, besides the ordinary symptoms of retroflexion, suffered from tormenting pain in micturition and was sent to be examined because of a large soft tumor above the left Poupart's ligament. I found retroflexion and gave as a diagnosis a swelling caused by distension of the ureter in consequence of the retroflexion. I could easily at the same time verify my diagnosis. As I introduced the catheter after straightening the uterus with the sound, and emptied the urine with the aid of outside pressure on the abdominal walls, the tumor, at first as large as a child's head, shrunk to the size of an apple. A diagnosis will be very much more difficult at the inception of the disease, when the ureter is but little distended and the kidney is yet sound.

Case II. Miss F,, a robust girl, in her 17th year, complained of deep-seated pelvic pain with whites, backache, and too free menses with severe molimen. Numerous nervous pains, a tormenting desire to urinate, a feeling of fullness as if the bladder were overdistended, and of spasmodic constriction in its neighborhood, also troubled her, at these times a small quantity of urine would be evacuated without relief. I found a very relaxed uterus, angularly pointed, retroflexed for more than one inch, which easily could be raised by the sound. A soft swelling on the left side somewhat above Poupart's ligament had been observed by the physician who sent the patient to me.

With the most careful examination, while the patient was lying on her back, I could not find this tumor, but when I examined her in the upright posture, I found to the left of and somewhat above the uterus, a swelling, which, when examined by conjoined manipulation, appeared of an oblong form and was somewhat tender, but at different examinations varied in size, shape, softness and resiliency. As the flexion improved the swelling disappeared permanently, and with it the difficulty in urination. I therefore inferred that in this case, also, there was distension of the ureters. Especially characteristic were the subjective troubles of the patient, the change of form and circumference of the tumor when in a fixed position; its disappearance in the recumbent posture, which evidently was caused by the distribution of the fluid along the distended ureter to the kidney; and, on the other hand, its appearance in the upright posture, in which the urine sank down upon the bent angle—symptoms that are pathognomonic of this rare form of urinary disorder.

Prof. Saexinger[1] mentions in these words a cause of the lesion in women: "Many women who suffer from carcinoma uteri die from uraemia because of the complete involvement of the ureters, or degeneration of their outlets, or obliteration of their lumen by large pieces of debris or proliferated masses. The result is a spiral-shaped ureter, that often is as large as a finger, dilatation of the kidneys, pelvis and calyces, atrophy of the renal paenchyma, hydronephrosis."

Dr. A. Gusserow,[2] in an essay upon the same subject, makes these remarks: "The involving of the uropoetic apparatus independently of the bladder in this disease (carcinoma uteri) is of importance. Very frequently one or both ureters are involved, resulting in a destruction of the renal function. Blau found that in 93 cases distension of one or both ureters occurred 57 times. Stenosis or total closure of the ureters rarely happens, because of a cancerous affection in them: ordinarily it is because of pressure on them at their entrance into the bladder by the cicatricial horny thickening of the pelvic cellular tissue. I have also sometimes observed that a cancerous affection of the bladder wall in the trigonum colli had more or less completely displaced the mouths of the ureters, whence, as often observed by others, continence of urine and the symptoms of uræmic poisoning will result; but suddenly, after the formation of a vesical fistula, the pent-up urine will flow away in great quantity and the uræmic symptoms will disappear. In other cases, as long as the affection is unilateral, it may be painless. A few times I have succeeded in remarkably emaciated persons in discovcovering hydronephrotic kidneys by palpation."

Apropos of these statements Mr. Todd[3] reports a

[1]Berliner klinische Wochenschrift, Nr. XXIII, 1869. Linksseitige Hydronephrose u. s. w., von Dr. F. C. Hotz.
[2]Ibid., Nr. XIX, 1880. von Dr. F. Rosenberger.
[3]Nouveau Dictionnaire de Medecine et de Chirurgie. Art. Reins par M. Labadie-Lagrave.
[4]Dictonnaire Encyclopædique des Sciences Medicales. Rein, (Pathologie) par M. E. Lanceraux.
[5]Nordiskt Medicinskt Arkiv., Band V, Nr. XII. Orn der partielle Hydronefrose, etc, af Dr. Chr. Fenger.
[6]Hildebrandt, loc. cit.

[1]Saexinger, loc. cit. Ueber Uterus Krankheiten.
[2]Gusserow, loc. cit.
[3]Todd, loc. cit, p 389.

case in which there was great pain in the neck of the bladder and a frequent desire to urinate, with alkaline urine, and, toward the end of life, incontinence from vesical irritability existed; at the autopsy the right kidney was found completely atrophied and the ureter converted into a large cyst; a cancerous mass in the bladder blocking up both ureters was also discovered.

There appears to be a pathogenetic relation between hydronephrosis and cystoid degeneration of the kidneys. This question had been ably discussed by Dr. Th. Ackermann[1] in an article describing the frequent simultaneous appearance of the two lesions, and to this paper we refer any who may be interested.

A patient came under the care of Prof. F. N. Otis[2] suffering from a persistently recurring spasm of the bladder that had resulted in a thickening of the vesical walls, dilatation of the ureters and hydronephrosis; in the opinion of Prof. Otis a contracted meatus urinarius was the primary cause of the whole difficulty.

Various anomalies of development may lead to hydronephrosis. Dr. F. A. Walter,[3] many years ago, described an instance occurring in a man thirty years of age, in whom were found on both sides double ureters and pelves: the right and lowermost ureter opened almost in the middle of the urinary bladder; the right and uppermost, after it had crossed in front of the lower, opened close behind the caput gallinaginis; the upper half of the right kidney "durch örtliche Vereiterung" was changed into a moderately strong bladder, while the half of the kidney corresponding to the lower ureter was perfectly healthy; nothing is said of the permeability of the upper ureter, but the drawing shows it as compared with its fellow to be from three to five times dilated.

Two similar instances of a limited hydronephrosis with double ureters and pelves, the one occurring in an aged widow, and which had been diagnosed as hydrovarium, and the other in a maniac 69 years of age, have been recorded by Dr. A. Heller[4], of Erlangen.

Prof. Simon[5] mentions as a comparatively common, though rarely noted, cause of hydronephrosis the formation of valves[6] at the ostium pelvicum, although the rest of the ureter is perfectly permeable. Of the cases collated below, eleven as to their causation fall into this category.

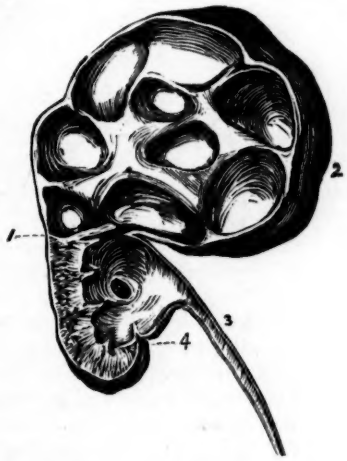
In those subjects where the kidney occupies a very deep situation, and where the initial portion of the ureter manifestly could be easily compressed or flattened; a curious instance of such compression is related by Dr. Labadie-Lagrave[7]. At an autopsy a kidney was found atrophied because of hydronephrosis, this lesion, in its turn, being dependent on a retention of menstrual fluid in one of the halves of a bifid uterus, which, forming a large tumor, by gradual compression, had rendered the ureter impermeable.

Prof. Kehrer,[1] of Heidelberg, in a recent article has called attention to the fact that large hydronephroses are only met with where there is a long continued but not complete obstruction to the flow of urine, or where, as sometimes happens, the obstruction is intermittent. This writer believes that displacement of the kidney, as thought by some, cannot cause a serious continence of the renal secretion.

In certain cases the most careful scrutiny has failed to find any mechanical obstruction, and their ætiology, therefore, is obscure.[2] In literature are recorded other causes of hydronephrosis, as abscess of the bladder, supernumerary renal arteries, congenital absence of ureters (Cruveilhier), imperforation of the ureter in its whole length (Bonnet), diverticula of the bladder (Ebstein); to sum up the ætiology, however, it may be stated that any obstacle to the continuous and free flow of the urine from the calyces into the pelvis, from the pelvis into the ureter, or from the ureter into the bladder, whether it exist on one or both sides, can lead to the development of hydronephrosis.

Many conditions, such as the position of the obstacle, the completeness of the stenosis and the duration of the lesion, may greatly modify the pathology of hydronephrosis: the lesion, too, may be bilateral, unilateral, or in rare cases even partial, *i. e.*, where not all of the calyces of one kidney are involved.

A very interesting case of the latter variety has been described by Prof. Fenger:[3] the patient was a young man in whom had been developed a renal tumor of traumatic origin; this, being punctured, poured forth urine. An inguinal abscess caused the death; and, at the autopsy, a partial hydronephrosis, limited by the superior portion of the kidney and formed by the distension of only one calyx, whose orifice was obstructed by a valve-like growth, was found.



Right partial hydronephrosis from valvular closure of the uretur, from Dr. Fenger's paper on "Partial Hydronephrosis"
1, Valve. 2, Hydronephrotic sac. 3, Uretur. 4, Normal calyces and papillar.

[1]Ackermann, loc cit., Seite 456.
[2]Otis, *Med. Gazette*, April 23, '82, page 123.
[3]F. A. Walter, Einige Krankheiten der Niere und Harnblase, Seite 14. Oertliche Vereiterung der Niere.
[4]A Heller, deutsches Arch. für klin. Med., Heft II, Seite 267. Hydronephrose der einen Nierenhälfte u. s. w. und Ibid, Heft VI, Seite 276.
[5]Simon, loc. cit. [6]"Klapperbilduug."
[7]Labadie-Lagrave, loc. cit., p. 12.

[1]F. A. Kehrer, Archiv. für Gynäkologie, '81, Heft III, S. 370.
[2]Rosenstein, loc. cit., p. 358. "In manchen Fällen ist kein mechanisches Hinderniss zu finden und die Ætiologie daher dunkel."
[3]Fenger, loc. cit.

It has more often happened, however, that these partial cases exist coincidently with double ureters; in a recent publication a German writer[1] has gleaned from literature seven such instances.

When the obstacle exists in the ureter or bladder there is found inside the hilum of the kidney a spheroid tumor of greater or less size, the walls of which are formed of the dilated pelvis. The kidney, pushed back, compressed and atrophied, fits over the tumor like a sort of helmet, and usually presents a deeply lobulated surface; this distension may, at the same time, occur within the pelvis and calyces.

At first the dilatation is slight and reacts with especial force on the walls of the pelvis, the renal tissue still offering to the touch its normal resistance; a little later the surface of the organ becomes covered with projections produced by distension of the calyces and atrophy of the renal substance, the kidney, as a whole, now assuming the flabbiness of a cyst filled with fluid.

When the pelvis and beginning of the ureter are distended inside the hilum the tumor assumes a pyriform shape, pointing downwards, as a rule, one or both kidneys attain great size and are transformed into immense bags, on whose inner surfaces are seen little islands of renal substance; on making a cross section the basin appears dilated, the papilæ more or less sunken, and the calyces elongated and funnel-shaped; to the touch the papillæ, recognizable by the convergent red striæ, seem roughened.

In the more severe cases the calyces are so dilated as to form large pockets continuous with the dilated pelvis; the latter when exsected and extended upon a table, presents countless folds, is nearly always opaque, of a pure white color, and in its substance blood-vessels can rarely be distinguished. The wall of the sac now is altered to dense connective tissue, that varies in thickness at different points; it has even been observed of the consistency of cartilage; generally, too, when the ureter participates in the expansion its muscular layer is hypertrophied, this condition being strongly marked in those cases where it has been excited in the effort to expel a calculus. The tubular and cortical substances, as a result of continuous compression, become so atrophied that M. Rayer[2] has seen the kidneys of a child that were no larger than a berry or Lima bean, and those of an adult, that, stripped of their membranes, weighed but two ounces. In all hydronephroses the renal blood-vessels are developed out of proportion to the size of the renal parenchyma.

Those curious partial hydronephroses, to which allusion has been made, have been often observed in some of the lower animals, notably in the ox.[3] In this beast cysts of the size of a child's head, and containing urine more or less modified, and sometimes calculi have been seen. Such an anomaly in man, the earliest one, perhaps, on record, has been finely depicted by M. Rayer.[4]

[1] Englisch-Deutsche Zeitschrift für Chirurgie, 1878. Band XIII, Seite 11 und 252. "Ueber primäre Hydronephrose."
[2] Rayer, loc. cit., p. 479
[3] Rayer, loc. cit., p. 499, "chez le bœuf," etc.
[4] Rayer, Atlas des Maladies des Reins. Pl. XXV., Fig. V.

Typical case of right hydronephrosis, posterior view, calculus found in the ureter that was dilated above and normal below where the stone was engaged.
Rayer, Atlas des Maladris des Reins, pl. xxi.

These tumors may attain enormous proportions. In the case of Johann Elzer, reported by Dr. Hotz,[1] the cyst extended from the first sacral vertebra and crest of the ileum clear to the pancreas, behind the border of which the upper limit of the cyst was lost. To the right it extended to and became adherent with the right kidney; it, moreover, included the left kidney, that was transformed into a tumor the size of a child's head. In addition, pushing outwards the left circle of the ribs, it considerably displaced the heart and thoracic organs, and was not limited until it had passed at least three inches beyond the linea alba.

Numerous adhesions to the neighboring organs constitute an unwelcome though frequent complication. In an autopsy performed by Dr. Wilien[2] the cyst was found wholly adherent to the peritonæum, and partially so to the omentum, pancreas, colon descendens, sigmoid flexure and spleen. The coils of intestine regularly are displaced, and for the most part lie in front of the tumor. Diastasis of the recti muscles has also been noted.

The histological lesions in hydronephrosis have been little studied. In severe cases there is first a nuclear infiltration[3] about the uriniferous tubules that is followed by a fibrous condition; the collecting tubes are obliterated, their epithelium undergoing embryonic retrogression; the glomeruli are either fibrous or cystic, and the lining of the convoluted tubes undergoes a fatty-granular degeneration. An examination made by Professor Krause,[4] of Göttingen, showed that the canaliculi of the cortical portion were distended and the Malpighian bodies enlarged. In the medullary substance the loops of Henle were greatly dilated and filled with fibrine casts and calcareous infarctions. The ureters exhibit a great variety of alterations; regularly they are narrowed below and dilated above the points of stoppage. Cases are known, though, where narrowing occurred throughout the whole caliber, this being the

[1] Hotz, loc cit.
[2] Wilien, Trans. Am. Med. Ass'n, 1875, p. 271.
[3] JOURNAL AM. MED. ASS'N Jan. 5, 1884, p. 10.
[4] Krause, loc. cit.

general condition where the obstacle exists near the ostium pelvicum. It has not rarely happened that the dilated ureter has acquired the dimensions of the intestine. In hydronephrosis arising from uterine difficulties, much dilatation is rarely seen. Coincidently with the widening occur thickening of their walls, hypertrophy of their muscular coat, and often an assumption of anomalous forms. Thus, Dr. C. J. Hare[1] observed an instance in which one ureter perfectly simulated the shape of the letter S.

Hydronephrotic fluid consists of the normal secretion of the kidneys more or less altered. Rarely, as in the case of Lee, (Labadie-Lagrave), it is urine pure and simple. In slight cases there is, of course, little modification in the secretion, but in the more advanced cases there is, as a rule, much change, urea rarely being present.

Half a century ago M. Rayer[2] demonstrated that albumen and urea were present in renal cysts; a careful examination of 600 cub. ctm. from a typical case revealed the following:[3]

Fluid weakly alkaline, specific gravity 1000.
0.33 grm. chloride of sodium, sugar, inosite.
0.47 " urea, biliary coloring.
0.11 " albumen, matter, etc., not detected.

The sediment from another case[4] was composed of numerous crystals of calcic oxalate, an abundance of lymphoid cells, uric acid salts, urea, and much albumen.

In Hotz'[5] patient the fluid was reddish-brown, slightly turbid, and odorless, holding in suspension albumen, broken down red blood corpuscles, but no traces of uric acid. Sir Spencer Wells[6] removed twelve pints of fluid from a young girl, that gave the following results on examination: color, a clear, light yellow; odor, faintly urinous; specific gravity, 1006. On standing a few floculent clouds formed. Urea, urates and chlorides were found in the proportions of normal urine. The microscope showed a few pus cells, many red blood corpuscles, some squamous epithelial and granular cells, but no tube casts or crystals; slight traces of albumen and phosphates, but no sugar were detected. The same surgeon, as well as Mr. Cooper Rose,[7] have mentioned examples in which there was no urea, and even none of the constituents of urine. The account[8] of a very unique case recently published makes mention of a gas, supposed to be carbonic dioxide, that developed in the cyst and gave rise to a metallic, tympanitic sound on percussion, and, when acetic acid was added to the contents of the tumor, gas in considerable quantity was evolved. The accumulation of fluid in these sacs is often enormous. Glass[9] observed a patient born with fluid in the abdomen, which at her death, at 23 years of age, contained nearly thirty gallons (100,000 c.cm.) of copper-colored serum; over nine gallons (36,000 c.cm.), as reported by Dumreicher,[10] were found in a case of P. Frank's—and Prof. Simon[1] watched for several years a patient, from whom, through an artificial fistula, there was a daily discharge of over six ounces (200 c.cm.) of a sero-mucous, albuminous nature.

From a study of the above facts these conclusions are reached: first, that so long as any of the renal parenchyma is capable of work and serous transudation takes place, the normal urinary ingredients in the sac will be preserved and augmented; second, that when total destruction of the secreting portion of the kidney occurs, a fluid more or less sero-mucous in nature remains, that, if a ferment is prevented from entering, will exist undecomposed for an indefinite period of time.

Hydronephrosis of slight degree causes no symptoms, and if the sac be unilateral old age may be reached without the discovery being made that any trouble exists. In more severe cases, however, symptoms referable to impeded activity of the kidneys, and to the presence of a large abdominal tumor, may be expected.

There have been noted severe pain in the bladder and vesical region, with constant desire to urinate (Todd),[2] total anuria, intermittent accumulation and escape of the renal secretion (Morriss),[3] bearing down pains with sensation of constriction (Hildebrand),[4] obstinate constipation from compression of the intestine, a cirrhotic or varicose appearance of the superficial abdominal vessels from disturbance of the circulation (Moreau),[5] etc.

In bilateral hydronephrosis, which sometimes accompanies cancer of the uterus, the supervention of acute or chronic uræmia may be looked for at any time.

Generally a palpable tumor that may be of great size is found in the abdomen. It is situated in the flank, and regularly extends from the region of the lumbar vertebræ forward to the umbilicus, downward to the iliac region, and upward into the hypochondrium. Displacement more or less of the viscera occurs, and on palpation distinct fluctuation, on percussion a dull note, may be expected. These tumors, by their constant growth, interfere more and more with the functions of the diaphragm, though, with the exception of a feeling of tension, they are often painless.

But because of the great advance in abdominal surgery, the differential diagnosis of hydronephrosis from other tumors similarly situated must be regarded of the first importance, though, unfortunately, it is attended with many difficulties.

It is most gratifying, however, to an enthusiastic believer, as the writer is, in the ultimate approach to something of perfectibility in surgical method, in the recognition and therapy of any subject, to trace a gradual, though often slow evolution from chaos to a state akin to order; and in respect to no other malady, as is our purpose to show, has this welcome change been more apparent during the last twenty years than in hydronephrosis.

[1] Hare, loc. cit., p. 29.
[2] Rayer, loc. cit., p. 480. J'ai recomme. dans ce liquide, de lierèe et une quantitè notable d'albumin," etc.
[3] Krause, loc. cit.
[4] Helier, loc. cit.
[5] Holtz, loc. cit.
[6] Sp. Wells, *Medical Times and Gazette*, 1872, Vol. I p 483.
[7] Cooper Rose, loc cit
[8] F. A. Kehrer, Arch. für Gyn., Heft III, p. 371.
[9] Rayer, loc. cit., p. 538.
[10] Simon, loc. cit., S. 187.

[1] Simon, loc. cit., s. 187.
[2] Todd, loc. cit.
[3] Morriss, *Lancet*, vol. 1, 1876, page 637.
[4] Hildebrand, loc. cit.
[5] Labadie, Lagrave, loc. cit., page 18.

[1] "The discrimination of an hydronephrosis from tumors of another kind, but especially from ovarian cysts, unless its gradual development be observed, must be very difficult, if not impossible." Many mistakes of surgeons of the first order are, therefore, recorded in medical literature. Nearly two centuries ago Bonetus[2] diagnosed such a case as a swollen spleen, and in our own day men of undoubted skill, as Professors Esmarch,[3] and Billroth[3], and Sir Spencer Wells,[4] with others perhaps less widely known, have each regarded the lesion as an ovarian cyst, and have operated for the latter affection. However, the statement [5] "that the diagnosis of an ovarian cyst from a nephrectasis in a very large tumor cannot be made apparent," is, it seems to me, now susceptible of some modification; for, by bearing the following statements in mind, an accurate diagnosis can be made in a good proportion of cases.

First. If a reliable history of the case be obtainable, it may be expected that any renal tumor, in its earlier stages, would extend forward from the lumbar spine, having first been noticed between the false ribs and ilium; while an ovarian cyst has, in all probability, first appeared in one inguinal or iliac region, and increased from thence upward and inward.[6] "Therefore," as Prof. Krause well remarks, "the importance of a careful observation of ovarian tumors in their early development, is very obvious."

Second. [7]Large tumors of the right kidney usually have the ascending colon on the inner border of the tumor. Tumors of the left kidney are usually crossed from above downwards by the descending colon.

Third. Regularly ovarian tumors are in front of the intestines, renal tumors are behind the intestines. The exception to this rule must occur only in rare and isolated cases. The intestine may not be recognized on percussion, but when rolled between the fingers it contracts into a firm, cord-like movable roll, or the gurgling flatus along it may be detected by the patient or by auscultation; to obtain tympanitic resonance, the colon might be inflated with air through a long elastic tube per rectum; but a surer means is to inject water in addition, whereby, the air can be forced clear to the ileo-cœcal valve. On the left side the tube may sometimes be felt through the abdominal walls. The discovery of intestine in front of a doubtful abdominal tumor should always lead to a careful examination of the urine, which, in renal trouble, may be expected to contain blood, pus, albumen or epithelial debris.

Fourth. [8]In ovarian tumors there is a movability of the cyst *in toto*, a condition that is never seen in hydronephroses.

Fifth. In renal cysts the uterus is freely mobile; in ovarian tumors this is hardly apt to occur. Dr. Rosenberger attaches much importance to this symptom, to which he says too little attention has been given. The best method of examination is by the hand introduced into the rectum, and for its effective accomplishment the use of an anæsthetic is required. [1]By this means, any connection of the tumor with the ovaries, uterus or bladder, may be mapped out with great exactness; with the other hand upon the abdomen, the pelvic organs may be defined from those viscera lying higher up; and, if this palpation can be made with half the hand (four fingers), not only may we determine whether the cyst is connected with the pelvic organs, but whether it extends from above down into the pelvis. This aid to diagnosis is especially valuable in hydronephrosis, as in this lesion the pelvic cavity is not narrowed, and because the dilated kidney can be felt as a single mass reaching into the introitus of the pelvis; moreover, the presence or absence of stones in the ureters, or change in their caliber can easily be made out. Trichmann (Labadie-Lagrave) invented an instrument bearing a certain resemblance to a lithotrite, which, when introduced into the bladder could, at will, stop the mouth of one ureter; thereby determining whether a ureter be at fault. Unfortunately, though the instrument may be employed on either sex, its use requires a practiced hand.

Sixth. [2]Just as ovarian tumors are usually associated with some disturbance in the catamenia or change in the mobility or shape of the uterus, so there is regularly found in connection with renal tumors some history of calculus, nephritic colic, hæmaturia, albuminuria, or change in the quantity or state of the urine. In rare cases, it must be admitted, this rule does not hold good.

Seventh. If some of the contents of the tumor be procured through a small canula, or by aspiration, its examination will greatly aid the diagnosis. If there be found in the fluid paralbumen, colloid substances or cylindrical epithelium,[3] they argue the presence of an ovarian cyst, while any trace of urinary ingredients or of pavement epithelium would indicate an hydronephrosis. A confirmation of the diagnosis may be arrived at by sounding through the canula with a long, slender, metallic sound. This instrument, if the cyst be of renal origin, can be thrust to the deepest portion of the kidney and swept under the liver and dome of the diaphragm, and to some extent down into the pelvis; if the tumor proceed from the ovary, the sound cannot reach nearly as high, but can be easily pushed far deeper into the pelvis. It is proper to add, that though the weight of authority seems to be in favor of an exploratory puncture of these tumors, with the utmost care, there is danger of supervention of peritonitis from the wound.

Eighth. [4]If the tumor be partially emptied, it will, if renal, be felt growing smaller in the direction of the kidneys; if ovarian, in the direction of

[1] Rosenstein, loc. cit. Die Unterscheidung, u. s. w.
[2] Bonetus, loc. cit., p. 290, obs. xxii. Quidam splenam intumuisse, etc.
[3] Kroner. Arch. für Gynäkologie, Bd. xvii. Rechtssirtige. H. U. s. w.
[4] Wells, Diseases of the Ovaries, p. 216.
[5] Krause, loc. cit.
[6] Wells, loc. cit., p. 222, and Braur, Lehrbuch der Gesammten Gynækologie, S. 927. Die linkssietige hydronephrosen, u. s. w.
[7] Simon, loc cit. Seite 208
[8] Rosenstein, loc. cit., and Simon, l. c S 205. "Die Beweglichkeit der Hydronephrose, als Ganzes ist gleich Null."

[1] Simon, loc. cit S. 88. The author has performed this 130-150 times.
[2] Wells, loc. cit. p. 223.
[3] Simon, loc. cit. p. 212.
[4] Simon, loe. cit., p. 214. [4] Simon, loc. cit., p. 214.

the ovaries; and if it be wholly emptied, a repetition of the sounding will be of value.

[1]Incision of the tumor followed by introduction of the finger has been practised. By this method the renal calyces were easily recognized as round or crescent-shaped cavities, that were covered with mucous membrane and bounded by sharp walls. In rare cases fortunate accidents have been of much assistance; thus, as noted above, it has happened that when a patient was placed in a certain position the tumor could be emptied through the bladder by external pressure, and in a few instances the ureter, enlarged, could be felt through thin abdominal walls.

[2]The discrimination of an hydronephrosis from other abdominal tumors is more easy to make, and its discussion will be dismissed in a few words: In renal cyst the swelling does not change its position with that of the patient, in ascites it does; echinococcus cysts are distinguished by the hydatid fremitus, and if situated in the kidneys by the escape of hydatid vesicles in the urine; pyonephrosis usually gives more severe constitutional symptoms and causes recurrent rigors and signs of suppuration, the same being true of perinephritis and renal abscess; finally [3]the "possibility of a horse-shoe kidney must ever be borne in mind" if from the symptoms an hydronephrosis be suspected, but the colon ascendens and descendens take their normal course.

The differential diagnosis between hydronephrosis and certain renal troubles that have a somewhat similar clinical history is often attended with difficulty, and to facilitate matters, a diagnostic table, slightly altered from one devised by Dr. J. A. Octerlony,[4] is appended.

Cancer Renis.	Hydronephrosis.
Generally unilateral tumor of enormous size.	Often bilateral, and of small size.
Tumor stationary, does not move with diaphragm.	Tumor fluctuating.
Runs a rapid course.	Of chronic character.
Well-marked cachexia setting in early.	No cachexia.
Pain generally intense and rarely wanting.	Regularly painless.
Hæmaturia occurs in fifty per cent. of the cases.	No hæmaturia.

Cystic Degeneration of Kidneys.	Hydronephrosis.
Always bilateral.	Often unilateral.
Tumor soft solid, non-fluctuating.	Tumor fluctuating.
In later stages, dropsy.	No dropsy.
Hæmaturia.	No hæmaturia.
Occurs in those over 30 years of age	Often congenital and in the young.
Tumor fairly well preserves shape of kidney.	Tumor does not preserve shape of kidney
Tumor slowly increases.	Tumor often of rapid growth.

A neonatus with double hydronephrosis is never viable, and even in those congenital cases when only one kidney is involved, life is often cut short because of the pressure exerted on the thoracic organs. [1]A unique case, however, in an infant, where existed atresia of both ureters with hydronephrosis of one kidney and cystic degeneration of the other, who survived 15 days, is recorded.

In those instances where the malady is bilateral, the danger is proportional to the degree of atrophy in the renal substance, all cases being more or less quickly fatal; these patients are not usually confined to bed but a few days before death, which regularly takes place in a rapid and unexpected manner.

The prognosis[2] in all hydronephroses that are uninterfered with is, in general, unfavorable, for, as the tumor attains great size, it occasions by pressure unbearable distress, and interferes with the functions of nutrition and respiration. The natural sequence is traumatic or spontaneous rupture, (an accident observed in four patients by Prof. Simon), or suppurative inflammation followed by death. Another event to be dreaded in unilateral cases is the involvement of the other ureter, though this accident may be deferred many years. A curious instance[3] of the latter variety is recorded where the first symptoms of the lesion were manifest nearly 50 years before death, that was caused by a calculus caught in the opposite ureter.

A spontaneous cure with *restitutio in integrum* can never be expected, since a kidney so altered and atrophied can never perfectly recover and perform its functions.

No longer ago than 1870 an eminent surgeon wrote in regard to the treatment of this lesion: "Of[4] therapy there can scarcely be any account; a careful avoidance of things hurtful to the other kidney must be the only problem. An opening of the hydronephrosis has been undertaken several times, partly with good, partly with bad results; chiefly it appears from diagnostic errors." And yet, but a few months earlier, an operation destined to revolutionize the surgery of the kidney was performed, for, on April 2, 1869, Prof. Simon, after a long series of experiments and careful study, first successfully practiced nephrectomy.

Purely medical treatment has rarely been of much avail. M. Rayer[5] advises, if the obstruction seem due to a calculus, that an attempt be made to soften or dissolve it, removing as far as possible all the causes that tend to inflame the cyst and increase the secretion of the pelvis and calyces; if the tumor seem caused by a malformation, as is probably the case if nephritic colic have been absent, the same author teaches that by frictions and light compression, the posture of the patient being continually changed, the normal course of the urine may be facilitated; and that, when the cyst walls seem to take on inflammation, an evil result may be aborted by local and general blood-letting, emollient cataplasms and the evacuation of the large intestine by enemata and purgatives.

As it is not possible to recognize this affection till

[1] Simon, l. c., p. 216.
[2] Ibid, loc. cit. p. 217.
[3] Hotz, loc. cit. p. 235.
[4] Octerlony, J. A. Trans. Amer. Med. Association, 1875. P. 143.

[1] Th. Ackermann, loc. cit.
[2] Simon, loc. cit.
[3] Rayer, loc. cit. Obs. II. A case is also noted here where the symptoms lasted 23 years.
[4] Rosenstein, loc. cit. "Von Therapie kann wohl kaum die Rede," u. s. w.
[5] Rayer, loc. cit., § 833.

it has reached a considerable development, prophylaxis is out of the question. In calculous cases Dr. Rosenstein[1] asserts that the alkaline waters are very efficacious as dissolvents, and in unilateral cases the treatment should consist of a careful regimen, scrupulous cleanliness, stimulation of the skin by frequent baths, and all means that are of use to keep the healthy organ in good working condition.

M. Lecorché[2] advises the abundant use of liquids and the avoidance of animal food where there is any reason to suspect a uric acid diathesis.

Where, as often happens, the ureter closes over the calculus by a sort of spasm, M. Lancereaux[3] proposes the hypodermatic use of morphine. In a case observed by the writer, cataplasms of stramonium leaves have given much relief.

It is of interest to add that there are three[4] recorded cases in which manipulation has effected a cure. In two of these cases, instructions were given for the abdomen to be rubbed with mercurial or iodine ointment, and while this was being carried out the tumors suddenly disappeared, their disappearance being followed by a large discharge of urine. In the third case the mother of the patient was in the habit of rubbing the tumor to relieve the pain, and the effect of the pressure was to cause the tumor to disappear and the bladder to swell up. In only one of these cases, however, was the relief permanent.

"The sum of medical doctrine on the subject amounts to this: Palliate where you can; do no mischief where you cannot." Every attention is to be paid to the general health of the patient, and all matters of diet, hygiene, tonics for the body, and consolation for the mind, are to be administered to support the strength and cheer the spirits. The true method of medical treatment "is to seek temporary relief of urgent symptoms by rational expedients, and either to encourage a buoyant anticipation of ultimate rescue by operation, or to lead the patient by degrees into the usual quiescence of confiding resignation to the inevitable, by the adoption of the tranquilizing motto, *Cede Deo.*"[5]

It is obvious that in the great majority of cases, for the radical cure of hydronephrosis, recourse must be had to the art of surgery, and it is a matter for sincere congratulation, as the data collected below by the writer show, that the experience of less than fifteen years has negatived the assertion, [6]"Die operative Therapie der hydronephrosen hat bis jetzt noch keine glängenden resultate geliefert."

The various operative procedures that from time to time have been practiced, may be resolved into two general classes: First, extirpation; second, the different operations to obliterate the cyst.

Again, broadly speaking, extirpation can be conducted in two ways—either through the peritonæum by abdominal nephrectomy, or extra peritonæum by lumbar nephrectomy.

[1] Rosenstein, loc. cit.
[2] Lecorché, loc. cit,
[3] Lancereaux, Dict. Encyclopæd. des Sciences Medicales. Art. Rein (Pathologie). J'ai des raisons de croire que dans les cas de ce genu, etc.
[4] Lucas, *British Med. Journal*, Sept 29, 1883.
[5] Spencer Wells, loc cit, p. 259. Reference is here made, of course, only to the most severe cases.
[6] Hotz, loc. cit., s. 236.

Abdominal nephrectomy may be divided into several steps.

First step. Incision of the abdominal walls. There is some diversity of practice about this incision. Thus, Prof. Esmarch[1] made a cut through the linea alba 15 ctm. (6 inches) in length; in a case of Dr. Kocher's[2] the incision was begun at the xiphoid appendix, and prolonged below the umbilicus; while in a patient of Dr. Martin's[2] the knife was first plunged into a spot about 5 ctm. (2 inches) above the umbilicus. In some instances, as suggested by Prof. Langenbuck,[3] an incision along the outer edge of the rectus abdominis, in the linea semilunaris, is recommended.

Second step. Isolation of the kidney.

After having detached the tumor from the portions of intestine or omentum that adhere to it, the peritonæum covering the anterior face of the kidney, and which generally is very thick, should be incised. Dr. Kocher recommends the incision of the posterior peritonæum to be made outside of the colon ascendens or descendens, or above the transverse colon, attributing one failure, though the operation was unfinished, to the fact that he incised the peritonæum below the transverse colon.

Third step:

The tumor uncovered, the cellular tissue by which it is adherent to the diaphragm, liver, spleen, etc., must be cut, carefully guarding against hæmorrhage that often is excessive, Prof. Esmarch,[4] in one case, being compelled to take, in all, sixteen ligatures. In the second case, for which nephrectomy was practiced, the patient died on the fourth day from hæmorrhage from the pedicle. The remaining procedure is similar to that so familiar in ovariotomy, viz.: Puncture to let off the contents of the cyst, isolation of the mass, ligation of the pedicle, careful sponging of the peritonæum, and closure of the wound.

Lumbar nephrectomy may also be divided into several steps.

First step: Incision of the integument.

Many operators now make the incision of Linser,[5] cutting about 7 ctm. from a line striking the tips of the spinous processes and parallel with it, and extending it from the inferior border of the 12th rib to the crest of the ilium. Mr. Couper,[6] however, and others, have employed an oblique incision as in colotomy; Dr. Klineberger[7] has suggested that it be curved, with its convexity upwards and inwards, thus sparing the last dorsal and first lumbar nerves; Mr. Lucas[8] advocates a combination of an oblique incision that should be higher than that for colotomy, that is, within about half an inch of the last rib and parallel with it, and of a vertical incision along the outer border of the quadratus lumborum, commencing at the upper edge of the last rib and extending to the iliac crest. The latter plan has been employed

[1] Simon, loc. cit., s. 220
[2] E. Quènu, Archives Gen. de Med., December, 1882, De la Nephrectomie
[3] Trans. International Med. Congress, vol ii, p. 278.
[4] Simon, loc cit S. 220.
[5] Quènu, loc. cit.
[6] Lucas. *Brit. Med. Journal*, Sept. 29, 1883, p. 614.
[7] *Medical News*, Dec., 1880, p. 750.
[8] Lucas, loc. cit. p. 615.

by Mr. Barwell, Mr. Morrant Baker, Mr. Golding Bird and Mr. House.

Second step: Uncovering the kidney.

The layers of the lumbar region to be incised are:

1. The fatty sub-cutaneous tissue.

2. A slender muscular layer.

3. The very firm lumbar aponeurosis. Here is an important land-mark, the external border of the sacro-lumbalis that is to be pushed to the inside.

4. The very strong middle lamina of the aponeurosis of the transversalis. This should be incised upon a grooved director that has first been bent on itself to avoid cutting the first lumbar and 12th intercostal vessels, which are first to be tied and then cut.[1]

5. The quadratus lumborum.

After cutting through the external border of this muscle, the anterior lamina of the transversalis, best torn by the forceps and finger, appears. The couche viscérale of M. Tillaux, composed of the kidney and colon joined, is the last structure to come in view. The kidney occupies the superior portion of this region.

Third step: to isolate the kidney.

This step is often very difficult; it has even been found impossible to execute, and the operation has had to be abandoned. The object is to be accomplished chiefly by the finger, aided by the scissors but slightly.

Any tearing of the renal substance, as it is likely to result in severe hemorrhæge, is, if possible, to be avoided. In such a complication Zweissel[2] seized the torn end of the kidney with a Nelaton's forceps and then proceeded to enucleate. Two other grave accidents have happened, injury to the colon, and opening into the peritoneal cavity. The peritoæum is perhaps, to some extent, unavoidably bruised even if it be not severed.

Mr. Barker advises that extirpation of the kidney with its envelope, that is almost an inch thick, should not be attempted, but the kidney should be extirpated alone. He asserts that separation of the kidney from its capsule, enucleating the organ with the finger, is always easier than to separate the capsule from the ambiant tissue; thus, in one of his cases, he lost much time, and copious hæmorrhage occurred in trying to get out the mass entire; later, changing his tactics, he enucleated with ease the kidney from the perirenal tissue, the latter course occasioning but little loss of blood.[3]

In hydronephrosis operated on by the lumbar method, the cyst should be punctured and its contents drawn off for the purpose of reducing its volume, that it may the more readily be drawn through the costo-iliac space.

Fourth step: Ligation of the pedicle.

On drawing out the kidney the pedicle should be grasped with one or two forceps and, as in ovariotomy, ligated. It is better,[4] perhaps, to tie the pedicle in two portions by passing a curved aneurism needle, armed with a double thread, through its middle, taking care to avoid the vessels and tying each part separately, this procedure giving greater security. Prof. Czerny[1] is of the opinion that it is better to cut the ligatures short rather than leave them out of the wound. A separate thread had better also be thrown about the branch of the renal artery that penetrates the superior portion of the kidney. The space obtained by the incision of Linser may be insufficient[2]. A second incision, parallel to the crest of the ilium, may be added, or the twelfth rib may be resected. Prof. Czerny has employed the latter method twice with success; in the first instance he resected 9 ctm. of the twelfth rib; in the second, he cut away subperiosteally considerable of the eleventh and twelfth ribs without opening into the pleura. But injury to the pleural sac may happen unless guarded against with the greatest care, as, in a patient of Dr. Dumreicher's of Vienna, the twelfth rib being rudimentary and the operator mistaking the eleventh for it, the incision was made too high.

Stimulated by this accident,[3] Dr. Hall, a prosector of Vienna, studied the topography of the twelfth rib and found that "the limit of the pleural cavity is represented by a line drawn from the superior border of the first lumbar vertebra to the extremity of the eleventh rib; this line strikes the twelfth rib when it is normal about 3 ctm. behind its cartilage; there the greater part of the anterior face of the rib is covered by the pleura. If the twelfth rib be absent there exists in its place a ligamentous tract that may be incised fatally on mistaking the eleventh for the twelfth." The rational conclusion, therefore, is before incising deeply, to be assured of the state of the twelfth rib.

If there is hæmorrhage from the pedicle, Mr. Lucas advises that it be not re-tied, but that the wound be stuffed tightly with sponges steeped in the perchloride of iron, and that a tight bandage be placed about the abdomen; in this way he saved one patient. The same writer has derived great benefit from wrapping the patient's extremities in cotton wool and flannel to guard against shock. "Of course in these grave operations antiseptic precautions are called for, and during the first four or five days after the operation anything pressing upon or interfering with the wound which might produce bleeding, must be prevented. The bowels must be thoroughly emptied before the operation; opium and a low diet prescribed in the first days afterwards. The catheter must be used, if necessary, but regularly after the operation if the urine is scanty. It will be conceded that nephrectomy in this lesion is a *dernier ressort*, and as taught by Prof. Czerny, is to be tried when the life of the patient is threatened, and other therapeutics have proven ineffectual. M. Olliver,[5] however, has lately brought forward a point that may be of importance: He is in favor, in those lesions where but one kidney is involved, of the enucleation of the disused organ for the reason, that as often

[1] Quènu, loc. cit
[2] Quénu, loc. cit.
[3] Quénu, loc. cit.
[4] *Medical News and Abstract*, Dec., 1880, p. 751.

[1] Lucas, loc. cit, p. 615.
[2] Quénu, loc. cit., and Lucas loc. cit.
[3] Quénu, loc cit.
[4] Medical News and Abstract, p. 752. December, 1880
[5] M Olliver, Bulletin de l'Academie de Médicine, 2nd serie. Tome xii, p. 1077. De la Nephrectomie; "Mais d'autre part, l'ablation d'un rein," etc.

happens with the eyes, sympathetic trouble might be induced.

That a patient, after nephrectomy, can perfectly perform all of the bodily functions is shown by a case of pyonephrosis operated on by Prof. Czerny. Although very low at the time of operation, May 22, 1879, she rallied; conceived in August of the same year; aborted on November 12, 1879, and born in December, 1880, a healthy child, nursing it herself for over a year.[1]

Nephrectomy determined upon, where shall the incision be?

If statistics be of value, those of Mr. Barker[2] give 59 per cent. of cures by lumbar, 50 per cent. by peritoneal nephrectomy. Those of Dr. Harris[3] are also somewhat in favor of lumbar nephrectomy. But these cases include all varieties of renal lesions.

Mr. Knowsley Thornton[4] prefers the operation by Langenbuch's incision, the advantage being that the parts are better exposed than by the lumbar incision.

Mr. Tait goes so far as to advocate an exploratory abdominal section to determine the diseased condition and the advisability of nephrectomy.[5]

On the other hand, M. Quénu is of the opinion that lumbar nephrectomy is to be chosen, in that it permits, after the kidney is reached, an exploration and substitution of nephrotomy for nephrectomy, or *vice versa*. In addition, he believes that the abdominal method is to be reserved for the largest cysts. Mr. Barwell[6] also favors the lumbar method when practicable.

Prof. Czerny, while regarding the lumbar incision as the safer operation, recommends that by the abdomen if the kidney be movable. A very similar opinion is expressed by Mr. Lucas.

Lastly, in the words of Prof. Kehrer,[7] "that the median incision is the easier accomplished and preferable to the flank incision there can be no debate. The motive not to open into the peritoneal cavity is to-day, considering the circumstances, of no value. But I think, nevertheless, that the choice of the seat of incision should depend upon the peculiarity of the case, and upon the place where the swelling lies nearest the integument."

In the first table at the end of this essay, in which are reported the results of 31 nephrectomies for hydronephrosis, it will be seen that 19 of these cases were operated on by the abdominal method, and 11 by the lumbar method, the manner of operating in one case[8] not being learned. Of these 31 cases, 15, or a little over 48 per centum, recovered. Of the 19 cases on whom laparotomy was performed, 8, or a little over 42 per centum, recovered, while of the 11 cases treated by the lumbar method,[9] 7, or over 63 per centum, were permanently cured. It is, perhaps, fair to add, as Mr. Knowsley Thornton has stated, that the higher mortality at present attached to abdominal section was due to the fact that many of the cases were stumbled upon by operators intending to remove an ovarian tumor.

The causes of death in the fatal cases, when reported, will be found in the table referred to above, and which is believed by the writer to be fairly complete.

(Completed in the Next Issue.)

[1] Czerny, loc. cit.
[2] Med. chirurg. Transactions, 1880-1881.
[3] *Amer. Jour. Med. Sciences*, July, 1882.
[4] *Med. Times and Gazette*, May 6, 1882.
[5] W. Walter, *Brit. Med. Journal*, Sept. 29, 1883, pp. 6-7.
[6] *Lancet*, May 26, 1883.
[7] F. A. Kehrer, Arch. für Gyn., 1881, Heft III., p. 383.
[8] Case XXV.
[9] Doubt is also attached to one of the cures by the lumbur method. (Case VIII.).

THE MILK SUPPLY OF BOSTON, AND THE BENEFIT TO BE DERIVED FROM THE SPAYING OF COWS.

BY MR. LLOYD F. ABBOTT.

[Read before the Section for Clinical Medicine, Pathology and Hygiene of the Suffolk District Medical Society, February 27, 1884.]

The milk supply of Boston may be divided into three classes: first, that brought in on the cars, and commonly called railroad milk; second, that brought in wagons from the surrounding country, and called out-of-town milk; third, that from cows kept within the city limits. Each one of these may be divided into three classes: first, from the new milch cow; second, from the farrow cow, or one that has been milked for a year or more; third, from a springer, or one with calf. The nature of the new milk is very loosening; it is well known among farmers that the first milkings given to a calf three or four weeks will scour it to death. This milk changes as it increases in age, until at the end of a year the milk of a farrow cow becomes very astringent. This milk, if given to a calf a week old, would have exactly the opposite effect of the other. The milk of the springer gradually changes until near calving; it becomes more watery, and has a limey taste.

Let us first consider the railroad milk. The distance from the city and the number of hands through which this passes (all of which have to be paid) make the farmers' returns small. The difference between a farrow cow milked out and a new milch cow is usually from $20 to $25; the farmer can better afford to let his cows go dry from two to three months than to pay the difference. Railroad milk is therefore mostly produced from new milch cows and springers. Let us visit Mr. B.'s dairy. He makes milk the year round and has cows coming in constantly. Some cows may be milked up to the time of calving, but in most cases they will go dry from one to three months—usually about two—and will give but little milk for some time before. The low price that Mr. B. receives for his milk and the loss he sustains while his cow is giving none, make it necessary for him to use all that he can of it. This, together with the fact that he does not see or know the parties who use it, make it natural that he should send to market milk that he would not use himself. Mr. B. commences to milk at one end of the barn; the first cow may be a new milch cow, possibly the first milking, and will fill, or nearly fill, a can. The next may be a farrow cow that has been milked for a year or more, or may be a springer about to calve; in either case will give

but little, and it will take the milk of two or three of them to fill a can. Therefore the milk from the same dairy may be of the greatest possible extremes. Mr. B. having finished his milking, the milk being at a temperature of 100° F., sets it in cold water, which will reduce the temperature to about 55° or 50° F. The milk is then disposed of for the night. The morning's milking is managed in the same way, perhaps with the exception that the collector comes before there is time to cool the milk off. It is then placed in a wagon and carried from one to seven or eight miles to the depot, by which time the milk is thoroughly shaken up and the temperature has risen several degrees. If the car starts from this place, the milk may be put on and iced immediately; otherwise it must wait until the train comes along, and reach a still higher temperature. When on board the cars it is iced, and by the time it has reached the city, from 8 to 10 A. M., the temperature has been reduced to 50° or 45° F. It is then taken from the car to the milk stable, where it remains usually from one to two hours before it is prepared for the consumer and iced. In the meantime the temperature has risen several degrees. The milk remains in the ice chest until two or three o'clock the next morning, when the temperature has been again reduced several degrees. It is then loaded on the wagon and delivered to the consumer. If there is any left over it is taken home, iced, and used the next day. This milk, therefore, is from 24 to 36 hours old before it reaches the consumer, and what is left over has 24 hours more added to it, and still people wonder why milk does not keep longer. This is the supply which reaches the city from 8 to 10 A. M. There are cars which reach the city from 1 to 3 A. M., which bring the milk of the night and morning before; a part of this is used the same day, but most is not used until the following day. It therefore may be used twelve hours fresher, but oftener twelve hours older, than that reaching the city earlier in the day.

As this milk comes from so great a distance it does not pay to carry out brewery grains or refuse vegetables from the markets. The cows are fed on such fodder as is raised in the neighborhood and on meal or shorts. But the milk dealer in the city is so far from his source of supply that he knows but little if any more about the cows or the condition they are in, or upon what they are fed, than the person who uses the milk.

The producer of the "out-of-town milk," being nearer the city, receives more for his milk, which, together with the extra risk of miscarriage from the effects of feeding on brewery grains, makes it about an even thing with him whether he changes his cows once in twelve or eighteen months, or has them "come in" in that time. This milk is from new milch, farrow, and springer cows, and is produced to a great extent from brewery grains; it receives very nearly the same care as the "railroad" milk until it reaches the stable of the dealer instead of going to the depot. The driver of this team starts from 12 to 1 o'clock A. M., which makes it impossible to bring in the morning's milk, and as the milking is the last chore at night, but few of our out-of-town men raising their own milk, and the dairies being scattered, milk is usually collected in the morning for the next day. It will be seen that the "out-of-town" man may bring the milk of the night before, but as a rule does not; it is usually from twenty-four to thirty-six hours old. As the "out-of-town" man goes home in the heat of the day, often reaching it at 3 or 4 o'clock, it is impossible for him to keep his surplus over. He has a certain poor neighborhood where he skippers his surplus milk, that is, sells it on the street, or from door to door, from a third to a half less than the usual price, often making up the difference with water, and the poor will buy it because it is cheap, though not so good. Several years ago, when milk was selling for eight cents per quart, I knew one man who used to make his extra milk one-half water, and sell it for five cents per quart, thus making a "good thing" of it.

The milk raised in the city should be divided into two classes: first, that from cows kept to produce milk for market; and, second, that of cows kept for family use. The first class is found near breweries, or near the salt marshes, and, to a great extent, the food is brewery grains and rotten potatoes, or other refuse vegetables. Many who have cows keep a team to haul brewery grains and go around the market and collect refuse vegetables. The Milk Inspector, in one of his reports, mentions finding rotten potatoes in a milk stable, but as he did not find the cows eating them, did not consider it a case with which he could interfere. This milk may be, and often is, delivered to the consumer warm from the cow, but is thinner in quality, and will not keep as long as milk from cows fed on whole grain, grass, or hay. In fact, the milk partakes to a great extent of the substance on which the cow is fed. The dealer realizes a good price for his milk, and can better afford to pay twenty or twenty-five dollars in difference in exchanging his cows than keep one three or four months that is giving little or no milk. This milk is produced mainly from new milch cows, farrows, and light springers. It is the custom with this class of milk producers to buy a new milch cow and keep her farrow a year or more, and then get her with calf, which gives her a more suitable plumpness, by which means she is disposed of with better advantage to the butcher.

The second class of city cows are those kept for family use, usually well fed, and often overfed. A person wishing a cow for family use, not being posted in the market and no judge of a cow, usually pays a high price; if he is fortunate and secures a good one, he receives a good supply of rich milk. If he keeps a daily record of the amount of milk obtained, he will find that once in about three weeks there will be a time, sometimes affecting three milkings, that the cow will not give more than one-half or two-thirds as much as usual, and that after each one of these turns there will be a gradual decrease, until at the end of a year she will not give one-half as much as at first, and that not nearly as good. Not giving much milk, and constantly giving less, she must be disposed of for beef at a loss; or, if the owner wishes to keep her and have her come in once a year, he must have her got with calf three months after she has come in, when the milk will decrease in quantity as well as in

quality. To sum up, the owner of a cow under these circumstances is sapping the milk which he intended for his family for six or seven months, and going without for two or three months, for the purpose of getting his cow to give milk again and producing a calf, which, although the material he has consumed, if devoted to milk, would be worth a great many dollars, the calf will scarcely bring a dollar, and often has to be given away. Besides this, the owner has to run the risk of his cow's coming in in bad shape, or of miscarriage. There is no domestic animal so liable to accidents of this kind as the cow, owing to her being milked, a disadvantage which no other domestic animal labors under. In such a case she will give little or no milk.

What I propose as a means of improving the quality of the milk, and at the same time reducing the cost of production, is the spaying of cows for milk, an operation but little known even among veterinary surgeons. After two years' experience and inquiry, I have been unable to find any one in Boston familiar with the operation. It consists of removing the ovaries from a new milch cow, which takes away all desire or ability for reproduction, and makes of her a constant milker ever after. These are some of the advantages gained by the operation: First, an increase in the quantity of milk, as the animal has nothing else to do but give milk or grow fat, and by giving milk-producing food the quantity may be increased a third. Secondly, the certainty of having a constant supply of milk of the same quality. Thirdly, producing a richer milk and of even quality, as the animal is always in the same condition, all causes of change having been removed; this alone is inestimable in its advantages to the sick, or delicate children. Without this operation, milk obtained from a new milch cow under the most favorable circumstances will vary much; once in three weeks there will be a time, often affecting three milkings, that the milk is at fever heat, and will not keep as long by one-third as when the animal is in the ordinary condition. It is not an uncommon occurrence for a person in delicate health, or a child, fed on a milk diet, although the milk be from one cow, and the greatest possible care taken of it, to have a bad day or a feverish night, for which no reason can be assigned, but which may be traced to such a cause as this. Fourthly, decrease in the cost of keeping, for by the operation causes are removed which produce waste of material that now goes to milk. Fifthly, by this operation cows may be kept for years, giving the same quantity of milk, thus avoiding the loss sustained while the cow is dry and the liability to accidents during calving. Sixthly, the spayed cow fattens more easily, its flesh is better than that of the ox, more tender and more juicy; indeed, no one is ignorant of the fact that all domestic animals, female as well as male, deprived of their procreative organs, fatten more quickly than those that retain them, and the flesh of the spayed female is more tender and juicy than that of the male. By this means the farmer will realize a better price for his cows when they have passed their days of usefulness as milkers, and the public will be protected from a practice often resorted to by farmers to obtain the best possible price for old cows—that is, to bring them to the bull, intending that gestation should give them more suitable plumpness, so that they may be disposed of to better advantage to the butcher. The result of this is a mere bloated, flabby flesh, which easily taints; broth made from it is not rich, and is without flavor.

I first became interested in this operation early in 1880, through information obtained from a work translated from the French. I afterwards obtained other treatises on this subject and soon became convinced of the advantages to be obtained by it. I made inquiries among veterinary surgeons, but could find none familiar with the operation. While making inquiries upon this subject I learned that Hon. Josiah Quincy had had the operation performed at his farm in Quincy nearly twenty years ago. I was told that it was a failure. To ascertain the facts of the case, I called on him at his home. He told me that spaying was performed under the direction of his foreman, and although he lost a number of cows by the operation he considered it a success, and of great benefit to both the producer and the consumer of the milk; that the cows continued to give a large quantity of milk for a number of years, and that the milk was of a superior quality. It is by his permission that I refer to this. He also informed me that at one time he thought of publishing an article calling the attention of the public to the advantages of this method of producing milk.

My experience teaches me that it will increase the flow of milk and also improve the quality, and that although there will be a slight decrease at the end of a year, the daily average will be equal to that given at the time of the operation. I have one cow that was spayed in November, 1880, was then giving ten and one half quarts per day, and now, after nineteen months of constant milking, nine and a half quarts, and she now comes to the barn every night with milk flowing from her bag. To make a comparison: I have talked with those who have had a longer experience in keeping cows than I have. They all agree that this is a liberal estimate: a cow giving fourteen quarts of milk when she comes in is an extra good one; that at the end of ten months (she coming in once a year) she would not be giving more than three or four quarts, and that not suitable for use, at which time she should be dried off and not milked the other two months; or that an average of nine quarts a day for ten months and none the other two months is all that could be expected, and that this result can be obtained only under the most favorable circumstances. This would give 2,736 quarts. Now I claim that under this operation a cow giving fourteen quarts may be made to average that for three hundred and sixty-five days in the year, as she would increase enough after the operation to make up for any slight shrinkage at the end of the year, making 5,110 quarts against 2,736, and also better milk.

I do not wish to lead any one to think that this operation is without risk, but after two years of practical experience I am convinced that the risk, when the operation is properly performed, is less than in ordinary cases of calving.

THE ÆTIOLOGY OF TYPHOID FEVER.

[A paper read to the Chicago Medical Society, March 17, 1884.]

BY J. F. TODD, M.D., CHICAGO.

In the selection of the subject of this paper, I was not unmindful of the fact that the ground had been traversed by the ripest men in our profession, and that I could add nothing new to the thoughts and opinions that have found a fitting place in medical literature. The topic was chosen because of its inherent interest and importance with the hope that the society might be stimulated to a discussion of the subject. The general prevalence of typhoid fever in this country and Europe during the past few years, and the revival of the theory of "a contagium vivum" constituting its essential cause, has served to develop general distrust in prevailing methods of treatment, and widely divergent opinions respecting its ætiology. The researches of Graves, Brettonneau, Louis, Murchison, Budd and Liebermeister, the contributions of scores of learned authorities, and the recorded observations of thousands of intelligent practitioners of medicine, only enable us to say that typhoid fever is an "essential fever" in a certain sense contagious, in a certain degree preventable, and that it may be properly classed with the self-limited diseases; further than this nothing has been positively established. A variety of views have been advanced respecting its nature, the development of its cause and the laws of its propagation, all sustained by apparently reasonable hypotheses, but they have all failed to advance to the position of clearly demonstrable facts. We are confronted with mortality reports that deride every pretension to even an approximation to an exact knowledge of the cause, prevention or cure of the disease. It remains constantly with us; exciting but little attention from boards of health; seldom referred to by the public press; constantly encroaching upon human life as a certain fatal factor, and an approbrium of therapeutic art. Its essential cause—the nature of the propagating principle and the process of its elaboration—are the principal subjects upon which professional opinion is divided. Since Dr. Budd's time the discussion of this subject has only been rivaled by that of Pasteur and Bastian and their followers on that of the spontaneous evolution of animal life. The extremes of professional opinion in this country are expressed in the published works of two of our most celebrated American authors.

Dr. Flint says in his "Clinical Medicine:" "It is vastly probable, if not certain, that the effluvia from human excrement not containing typhoid dejections may cause the disease."

Prof. Bartholow, in his "Practice of Medicine," pags 689, says: "It is never produced by mere decomposition of animal matters, fæces or the contents of sewers; it is essential to the formation of the poison that the typhoid germ be present, and this germ finds in these decomposing animal matters a suitable soil for its growth and development."

Dr. Harley and Dr. Bristowe, of England, entertain equally discrepant opinions and express them in yet stronger terms, the former, not content with an enunciation of the view of its spontaneous origin, adopts a classification, naming varieties of the disease with reference to supposed origin and anatomical lesions, as "simple inflammatory," "contagious" and "paludal," "enteric fever." Dr. Bristowe strongly inclines to the view that the cause of the disease is not "a mere inorganic or even organic result of decomposition, but like other contagia an organized living particle which has special endowments and unlimited powers of multiplication," a specific virus yielded by the bowels of patients suffering from enteric fever, and probably by them alone. This view is ably sustained by Liebermeister, and it is probably the commonly accepted view of the profession.

There is an immense amount of evidence that the germs of the disease are developed in typhoid excretæ, and conveyed by water, and the atmosphere, and probably by milk and diseased meat, in quantities sufficiently large to develop the disease in individuals susceptible to the infection. It would tax the patience of the Society even to briefly refer to the chain of evidence quite familiar to you all, no doubt, in support of this view of the propagation of the disease. The proof would seem irrefragible that water contaminated by the alvine discharges of typhoid fever cases is capable of producing the disease. It appears almost equally clear that it can be conveyed in milk, and the evidence is strong enough to warrant belief that it can be produced by meats contaminated with typhoid germs. The most important of all the questions in the ætiology of the disease is the old and mooted one as to whether or not it may originate *de novo*. Having no practical acquaintance with the use of the microscope, and only a general knowledge of the results of microscopical research it would be presumptuous to present the views of investigators in that line of inquiry. It is perhaps fair, however, to say that nothing conclusive or particularly valuable has been learned with reference to typhoid fever, and that it is yet an open question whether the microphyte observed in cases of fever occupy a relation of cause or result. A few years ago it was quite the fashion to ascribe the origin of the whole class of zymotic diseases to sewer gas and the decomposition of organic matter. It was an old belief, sustained by abundance of old authority. On its revival it enlisted the enthusiastic support of many able practitioners, and sanitary engineering and disinfection became the fashion of multitudes who promised the world comparative immunity from infectious diseases; the ordinary attendants of filth and poverty, in the slums of cities, where it most abounds, the character of food, insufficient in quanity, and wretched in quality, lack of clothing and fuel in inclement seasons, the influence of immoral practices transmitted through generations of people, all combined, was for the time treated as a matter of secondary importance when compared with filth as a factor in the production or propagation of zymotic diseases.

That belief, however, is fast giving way, and it is,

in fact, an open question, and a very doubtful one, as to whether the elaboration of typhoid germs is to any considerable degree influenced by filth deposits. Watson's lectures on the ætiology of continued fever clearly outlined the observations of the observant members of the profession before his time and since, and strikingly illustrated the fallacy of the idea of spontaneous origin of fever by reference to the domestic habits of the natives of the Arctic regions, and the tropics, the exemption from the disease in African slave ships and in English prisons, except when the disease was imported. He quotes the opinion of John Howard, whose sagacity in all matters pertaining to the physical requirements of prison inmates was only surpassed by his philanthropy: "That some cause other than filth, ill-ventilation and over-crowding is responsible for the production of fever." He further cites the fact, familiar to us all and confirmed by our own observations, that the putrid atmosphere of dissecting rooms and the noxious effluvia of rendering establishments do not produce the disease. Stokes, in his lectures on fever, gives a graphic account of the filthy condition of an overcrowded town of 6,000 people in the South of Ireland, in which no epidemic of typhoid had ever appeared; in fact, it was considered a remarkably healthy place, notwithstanding the fact that 4,000 people lived on 25 acres of land, breathing the exhalations from 7,000 cubic yards of fetid matter. He also quotes Dr. Pratt, a government medical officer, as stating that filth agencies cannot produce the fever. "Were it otherwise, Ireland would before this have been depopulated from sea to sea."

The theory of the causative influence of sewer gas has been lately quite vigorously opposed by Dr. George Hamilton in a lecture before the "College of Physicians and Surgeons, of Philadelphia," in which he quotes a recent statement of the eminent sanitarian, Geo. E. Waring: "*that the sewer gas theory in regard to typhoid fever was, in the opinion of sanitarians, exploded.*" He cited the fact that the filthiest cities are often exempt from typhoid epidemics, and that the best sanitary conditions confer no immunity from their occurrence—this view is strongly corroborated by a recent report of the sanitary superintendent of New York city, which gives a large increase of typhoid fever coinciding with marked improvement of sanitary conditions, and a season of more than ordinary salubrity. Professor Loomis, in his late work on "Fevers," sustains this view with the statement that the prevalence of the disease is relatively greater in the country, where sewer gas is unknown, than in cities where immunity from its influence is exceptional. In a valuable contribution to the *Medical Record* of New York, Nov. 17, 1883, Dr. Francis Delafield presented a statement of mortality statistics for that city, in which it appears that the mortality from typhoid fever was greater in 1864 than in any year since that time, and that the mortality and prevalence of the disease has so greatly varied during the twenty years, that no constant or highly important relation can be supposed to exist between the ordinary, slightly varying, local conditions and the disease.

In a monograph on typhoid fever, by Surgeon Francis A. Welch, of the English Army, published last year, he presents an analysis of a large number of cases for home and foreign military stations between the years 1860 and 1878 inclusive. His contribution abounds with facts illustrative of the influence of climate in modifying the course and mortality of the disease, with abundant evidence that under all circumstances of military life, in all countries and every variety of climate, the clinical and post-mortem features of the disease are essentially alike. "In heated plains and cool hills, the moisture of the sea-coast, the drouth of central India, combined heat and moisture, combined heat and dryness, the disease existed and developed in the phases familiar to European observers." He reports the existence of large numbers of cases in salubrious localities, and its total absence in others characterised by filth. In the stations on the west coast of Africa he gives a single case for 1867, notwithstanding the existence of the alleged factors of the disease in an unusual degree, "filth of every character abounded; the air, earth and water were polluted with fecal matter, and vegetable matter constantly undergoing decomposition in a climate noted for its insalubrity." He attributed the existence and extension of the disease in military life to its importation from home stations, to infection from civilians among whom it existed as an endemic, and to air and water containing the specific poison. He sums up his conclusions with the opinion that a disease of universal prevalence, occuring under widely varying conditions as to climate and habits of life, and yet retaining its individual character, must be due to the same specific cause. These observations on an extensive scale—occuring in military service—so strikeingly accord with the observations of medical men in agricultural districts, I feel justified in giving the history of a series of cases occurring in my own practice, introducing that, with a brief report from a friend in the interior of the State.

My friend, Dr. George A. Wells, a skillful practitioner of Galva, in this State, kindly sent me the following brief report: "On the 15th of August, 1883, he was called to see Mr. J. C. Swan, a young farmer, 23 years old, and found him suffering from typhoid fever. His mother being sick with dysentery, and having no help in the house, an aunt of the patient, living seven miles distant, came to their assistance. She arrived about the tenth day of the fever; thinking she could better do the washing for the family at her home, she moved all the clothing there, including bedding stained with fecal matter, and washed them. In a few days she was suddenly taken ill with fever, and at varying periods three other cases succumbed to the contagion. The sanitary surroundings at the home of the aunt were very bad; the water of the well was thought to be impure, and a large privy and hog yard was located near the well and dwelling house. There were members of other families, however, whose sanitary surroundings were equally as bad, as constant in their attendance on the young man, but they neither contracted the disease or conveyed its poison." The doctor expressed the opinion that the germs of disease were conveyed

in the soiled bedding, and found congenial soil for active development. The report concludes with the statement: "It is impossible to say where the germs were received in the case of the first patient, as he was traveling over the country with a threshing machine."

My own experience in a considerable practice, extending over twenty years, has convinced me that typhoid fever does not originate *de novo*. For nearly twenty years my practice was confined to country villages and farming districts, situations in which familiar acquaintance with individuals and their surroundings usually enabled me to trace the cases that came under my observation to sources of infection supplied by preëxisting cases. My first patient suffering from this disease was a resident of Chicago, who for three or four weeks previous to his attack, had been in the employment of a railway company and boarding at a village hotel in the interior of the State. There had been no cases of fever in the hotel previously, and for a year none in the village; he could give me no information as to its origin. My patient was taken ill on the 3d of December, 1863, and returned to Chicago late in the following month. The ordinary precautions as to disinfection were advised, but imperfectly observed. On the 3d of the following September, I was called to treat a case of typhoid fever in the family of the landlord of the hotel, and on the 23d of the same month assumed charge of another case. On the 9th of October, 1865, another case developed, and between that time and the 15th of December, I treated five cases. The next case developed in January, 1866, and was the last of a series directly traceable to the imported case of December, 1863. During the period covered by the history of these cases, the disease developed in a farming community six miles north of the village, but I had no opportunity to trace it to its source. From one of these cases, however, the disease was communicated to seven persons living in the village—all of whom were under my management.

In December, 1865, five cases occurred in a farmer's family, the first of which developed in a young man who had been engaged in watching a friend suffering from the disease in a distant neighborhood. The disease appeared in the four following cases in periods varying from eight to fifteen days. During the years 1867 to 1874, inclusive, I treated a large number of cases among Swedish and English immigrants, under circumstances unfavorable for tracing them to the initial case. Many of them gave histories indicating infection on the ocean, and many others occurred in the order so commonly observed, a single dwelling breeding typhoid fever for an entire season. During this period, I cannot recall an isolated case of the disease occurring in my practice. In October, 1878, in an entirely new field of practice, a case occurred in a farming community, in which I could obtain no history of a previous case later than 1870. The patient was brought to my office in a delirious condition, which, with other symptoms, enabled me to make a diagnosis. He resided with a brother-in-law a mile distant from his father's farmhouse. On the sixth day of his illness (the third after my interview), in the delirium of fever and in the night he struck across the fields and reached his father's residence. On my visit that day the family were apprised of the danger of infection. The dejections were ordered to be thrown into a pit and covered with fresh earth. Notwithstanding this precaution, seven persons became affected with the fever, in periods of six, ten, twelve, fourteen, eighteen, twenty-three and twenty-six days from the date of the reception of the first case in the family. Two of the patients were hired men, and leaving in the prodromic period of their illness, communicated it to three friends who attended them in a small village five miles distant.

This epidemic, occurring on a prairie farm, remote from the ordinary sources of contagion, in a neighborhood in which no recognized case of typhoid fever had occurred during eight years previously, stimulated my industry in the search for its origin. The patient first attacked made a business of threshing grain, and travelled over an extensive farming district. After his recovery, I questioned him closely in regard to previous disease in the families for whom he had worked. After diligent inquiry, it was ascertained that a short time previous to his illness, he had worked at a farmhouse in which a Swede immigrant had recently died of so-called inflammation of the bowels, *after an illness of three weeks*. In September, 1881, a young farmer contracted the disease in a grain-threshing tour which brought him in relation with families in which typho-malarial fever (?) had occurred the previous fall. During his illness, a friend living nine miles distant watched with him two or three nights, contracted the disease and communicated it to several members of his family, and they in turn developed a neighborhood epidemic.

In October, 1881, I treated four cases in a family, the fourth of which was a young lady but lately returned from a boarding-school in which the disease had lately existed. In the same month, in a family in which three cases occurred, I traced the infection to a tenement house on the farm in which a case occurred the previous winter. The brief history of these cases perhaps only possesses interest as cumulative evidence to that already existing in great abundance, that the disease has been properly classed by Liebermeister as miasmatic contagious. I have never found in my practice the slightest evidence that it is directly contagious, but it has appeared conclusive that the excretæ of typhoid patients contain an exceedingly active disease germ, capable of propagating the disease to individuals susceptible to its influence. The period of time required to develop the germ, or morbific material, after its discharge from the body, will require the most patient investigation. In country practice the lack of skilled nurses, and the habit of changing attendants to suit the convenience of neighborhoods, is a fatal bar to successful inquiry. If bed linen is not frequently changed, and the anus and surrounding parts thoroughly cleansed on the occurrence of alvine discharges, disinfection of the bed-vessels and discharges will amount to nothing for statistical purposes. The neglect of this precaution in whole or part is the rule, not then the exception. The length of time during which the germs

will retain active vitality is another problem equally difficult of solution. It is apparently well established that they may retain their vitality for a year or more.

The cases recorded give but one of relapse. In that case there was no evidence of new infection. It was treated as a septicæmic fever. Five cases of latent character were observed presenting the unmistakable character of the disease, but lacking the nervous prostration and muscular weakness that prohibit gentle out-door exercise. These cases are not included in the preceding reports. In no instance have I observed a second attack of the disease in the same individual. It has appeared, however, that certain families are more than ordinarily susceptible to this and other zymotic diseases. The common remark that certain families are apt to take every prevailing disease, is confirmed by the observations of country practitioners, and stimulates inquiry as to whether or not diathetic conditions, hereditary or acquired, may not influence the extension of acute as well as chronic diseases. My observations do not sustain the Pettenkofer theory or the opposing English theory of the dissemination of the disease. Its virulence and prevalence were about equally observed in wet and dry seasons. Its prevalence has been apparently uninfluenced by habits of life, geological formation or topography of the country. Its prevalence in 1865 was preceded the previous year by that of ague in the creek bottoms and low valley lands, but the succeding local typhoid epidemics did not occur in such localities during the 20 years of my practice in the country. I treated epidemics of small-pox, rubeola and scarlet fever, and experienced quite as much difficulty in tracing these diseases to their initial cases as I did in those of typhoid fever. The habits of country people in the care of the sick are influenced in no small degree by the ardor of their friendships, and their zeal in rendering service. To this fact we may partly attribute the greater relative prevalence of typhoid fever in country neighborhoods. Another cause consists, perhaps, in the difficulty in securing timely removal and disinfection of fecal discharges; in short, skilful nursing, which implies practical isolation of the patient, exemplary cleanliness, and thorough ventilation of the sick-room. During my observations of this disease, there has been a constantly growing conviction of the fact of its contagiousness by means of fecal germs, and this conviction has been strengthened by the failure of supporters of its *de novo* origin to instance facts to sustain that theory, corresponding with the experience of thousands of general practitioners through the rural districts.

The ætiology of the disease, including the study of the precise nature of the *materies morbi*, the length of time required to elaborate its active properties, either within or outside the body, how long the active properties can exist in fecal matter, and the circumstances under which these poisonous properties are longest preserved, and the manner in which the morbific material gains access to the human system, constitutes a series of the most intricate problems before the medical profession—problems which may require the best efforts of future generations to solve. The mortality resulting from the disease, and its uniformity under the various methods of treatment employed, is a painful reminder of the importance of studying the laws of its propagation, which, clearly ascertained, may enable us to place limits on its prevalence. We can then better afford to await the discovery of a specific for its cure.

MEDICAL PROGRESS.

MATERIA MEDICA AND THERAPEUTICS.

ON THE USE OF IRIDIN IN THE TREATMENT OF THE SICKNESS OF EARLY PREGNANCY.—Dr. D. Barry Hart, (*Edinburgh Clinical Journal*), recommends highly the following:

℞. Iridin.....gr. ij.
Cons. Ros.....9. S.
Fiat pilulæ, with tales..iij.
Sig. One at night.

This must be followed in the morning by a draught of Friedrichshall water, a teaspoonful of the Carlsbad salts, or a doubly strong Seidlitz powder. Dr. Hart claims simply to apply the known views of Rutherford concerning the action of iridin upon the liver, as inducing a flow of bile, to a condition, pregnancy, that exerts an influence upon the liver, and in this way probably induces vomiting.

A HOSPITAL ELECTRICAL DEPARTMENT.—The last volume (XIX) of the Saint Bartholomew's Hospital Reports, gives an illustration with the descriptive text by W. E. Stevenson, M. B., of the electrical department of the hospital which it is proposed to establish. A lower floor is taken, which supplies a lobby with benches for patients in waiting, a work shop with an engineer's room communicating, and provided with a lathe, sink, shelves for chemicals, etc., etc.; and three warm, dry, commodious rooms with accommodations for dressing and undressing patients. These three rooms connect with each other, and their electric element boards are each connected with sixty modified Leclanchè cells (in the cellar below), and are provided with a commutator, interrupter, rheostat, "on" and "off" shunt, galvanometer and induction coil. There are extra trays of six cells to work the coils. The Bunsen's battery for galvano-cautery is composed of six cells. In room No. 1, there will be a frictional machine for producing statical electricity, and an insulated couch and benches; also a small table for operating purposes, such as operations on nævi, circumcisions, etc. There will be an element board, and under this board a couch will be placed on which the patient can recline, and it will be possible to use the galvanic or faradic current at will. In room No. 2, will be a similar element board, worked in the same manner, but it will also be possible to use the current for the electric bath in the adjoining room. No. 3, the bath room. The portable batteries for use in the department and for lending to the wards, will also

be kept in this room, and also the electro-magnets belonging to the hospital. In the workshop all the minor repairs of the electrical apparatus used in the hospital will be carried out, and the man in charge will supply and receive the batteries used in the wards. He will also prepare the galvano-cautery batteries when they are required.

MEDICINE.

THE TREATMENT OF PARTIAL EPILEPSY BY ENCIRCLING BLISTERS, WITH TRANSFER OF THE AURA.—Dr. Thomas Buzzard, in 1868, first called attention to this mode of treatment, and now (*Lancet*) gives a case to illustrate the success which he has met with in the past fifteen years. He considers this treatment as frequently of great service. In the majority of cases there is a distinct effect upon a number of the attacks, now and then stopping them altogether for considerable periods, and in other instances occasioning a very marked prolongation of the intervals between the seizures. On the physiological side, the strange influence exerted upon the site of the premonitory aura by the application of the blisters is very interesting. There has been a transfer (in the case given) of the aura from the right foot and leg first to the left foot, and later to the right groin. There is no marked uniformity in the mode of transfer in such cases. For example, in one patient a tickling in the left arm had always preceded the fit. After the application of a blister encircling this limb the tickling was transferred to the left leg. In another case characterized by a similar aura, the fits, as well as the tickling, ceased after the application of a ring of blister. In a third a sense of numbness in the left wrist was transferred to the right wrist. This was a case of cerebral tumor, as a subsequent autopsy showed. Another patient was a woman whose fits had always been preceded by cramp in the right hand, and who, after the blister, was affected with cramp in both hands before her fits. In the case of a patient whose fits had always been preceded by cramp in the left foot and shaking of it, with numbness of the left leg, a ring of blister was applied to this leg, and in subsequent attacks it was the right leg which became numb and shook. Tingling in the left arm was the aura in another case, and after blistering, a jerking of both arms and the left leg would take place at the beginning of a fit. Strangest perhaps of all was the case of a female patient whose attacks always commenced with cramp in the left hand. She had suffered from a severe fit two days before she came to the hospital, and the left hand then still remained quite powerless, as indeed she said was always the case after a fit. An encircling blister was applied to the left wrist. Next day the left hand had quite regained its power, but the patient complained that the right hand had *ipso facto* become weak. A few days later when she came to the hospital, the dynamometer showed 40° as the grasp of the left hand, and only 18° as that of the right.

Dr. Buzzard quotes an article by Professor Hirt, of Breslau, as corroborating his experience as regards both the therapeutical value of this method and the occurrence of transfer of the aura. In one case of unilateral convulsions without loss of consciousness, in which the attacks were exceedingly numerous every day, and always preceded by a tickling in the left arm, above which the blister was applied, the attacks ceased, and did not recur during the six months preceding the report. In a second case the aura was a trembling of the great toe of the right foot. Blistering was followed by cessation of attacks for two months, and in a fit which then occurred it was noticed that the trembling affected the big toe of the left foot. A third case is that of a shoemaker, in whom the cessation of attacks consequent on the treatment was attended by such feelings of discomfort as to cause him to regret his previous condition! In another example there was transfer of the aura, which consisted of over-tension of the fourth and fifth fingers of the left hand to the other side.

There would seem to be sufficient evidence to show that epileptiform convulsions beginning unilaterally depend upon a lesion of the cortex cerebri. As regards the situation of the centers which receive impressions of common sensation, we can do little more than infer that the place of reception for impressions coming from a skin covering the limb is probably in close association with the center for the movement of its muscles. If this be so, the irritation of a blister causing a molecular change, which is propagated centripetally, may be supposed capable of influencing in some way the liberation of movement.

As a matter of detail, a distinct advantage has shown itself in the blister being employed in the form of a ring or bracelet encircling the limb. An effect has been produced where the previous application of a quadrilateral blister has failed. A ring of blister applied above the ankles, involves cutaneous branches derived from the lumbar as well as the sacral plexus, through the anterior crural and sciatic nerves. A blister acting upon these nerves may be conceived, therefore, to be capable of producing a more intense impression than one which should only affect the branches derived from one or other of these large nerves. Professor Hirt employed blister of but half an inch in width, and it is very probable that a still narrower ring than this would be found sufficient.

THE PURPURA OF CHLOROFORM.—M. A. Moret Lavallie gives, in toe *Annnals de Dermatologie et de Syphiligraphie*, reference to three cases which demonstrate the possibility of the development of a purpuric eruption under the influence of inhalation of chloroform. In two of these cases the eruption was produced in identically the same manner, at the commencement of inhalation, in the course of one to two minutes, a discret eruption of purpuric spots, with a medium diameter of three to four millimetres, the blood being determined to them with such force as to transform several of them into sanguineous bullæ. The eruption did not seem to be about the hair follicles—in all three of the cases it occupied the same situation, that is about the middle of the body, and principally upon the anterior surface of the thorax.

Do these purpuras take rank among the medicinal purpuras, such as are produced by mercury, copaiba,

belladonna, ergot of rye and the preparations of iodine. The eruptions produced by these drugs only appear after the lapse of a certain time. Here we have an eruption appearing with the first inhalations of chloroform, the drug not having had time to impregnate the nervous system, it seems to belong to those purpuras which follow violent emotions, ranking among the nervous purpuras the chloroform acting by producing a brisk shock to the nervous system either by its anæsthetic or simple reflexation, due to the disagreeable impression felt by the patient, who is suddenly compelled to inhale vapors so irritating to the pharyngo-laryngeal and oculo-nasal mucous membranes.

The third case was a robust woman of 25 years, with facial eczema. She was chloroformed to open a deep abscess consecutive to a post-typhoid costal periostitis. During the first inhalations the skin of the upper part of the chest became of a dull white, then it was covered by a series of large striæ, alternatively white and red. Immediately afterwards, here and there upon the chest appeared a cluster of purpuric spots, the cutaneous base of which had resumed its rosy color as soon as the spots were well defined.

THE PRACTICE OF MEDICINE IN BOMBAY.—Assistant-Surgeon Sakharam Argion L,M., gives (*Trans. of the Medical and Physical Society of Bombay*) an interesting sketch of the indigenous practice of medicine and the European practice of medicine in Bombay.

As regards the indigenous practice of medicine the Ayur Veda has in it the essentials of the Hindu system of medicine. The Hindu Vedas are the oldest written books known to the human family, and a record of what the Ayur Veda contains was known to the people long before it was put into writing, and was handed down from man to man by personal communication. On the Ayur Veda were founded the two subsequent works, Sushruta and Charaka, both written on an identical plan, the former treatise treating more of the subjects of surgery, and the latter those of medicine. A compendium of these was subsequently brought out at a later period by a learned physician and his grandson, known as the Vagbhatas. This is the standard work studied and referred to by the learned physicians of India at the present day. Besides this there are a number of others which treat of different special subjects. Of the fact that the Hindu system recognized the study of anatomy and physiology as essential preliminaries to the study of medicine one can easily satisfy himself by studying the original treatises Sushruta and Charaka; and the symptomatology that obtains therein does not materially differ from what one sees even in these days in a general treatise on medicine. Surgical and midwifery operations, the instruments therein required, and the mode of manufacturing them, have been described in detail. Rectal injection and enema syringes have also been described.

To have studied medicine systematically involved a full and elaborate preliminary literary course which extended over nearly twelve years. A special course of technical studies, when added to this, really made the man what he was then called, and amply deserved to be called, the Physician Royal. Under foreign rule, and lacking support, encouragement, and the proper institutions for the clinical study of diseases, he has died a natural death. He is no more to be seen; his place is taken by No. 2, the king of physicians. who has minor qualifications, is of mediocre proficiency in Sanskrit, and has a vague knowledge of diseases and their treatment. No. 3 is the ordinary practitioner of the country, who has emerged from a reciter of religious histories, a clerk or a schoolmaster, and in after life has associated himself with some senior man in actual practice, as a cook, an assistant, or an apprentice on stipulated terms. Sometimes he claims his descent from a renowned ancestor, and professes to be the possessor of his secrets, handed down through several generations. He is perfectly devoid of any knowledge of anatomy and of medicine. He professes to know the nature of the complaints of his patient by feeling his pulse, and pulse alone, and at times by the examination of the urine, which he conducts by dropping a litle oil in it. He ridicules English practitioners and their drugs by representing the former as having no knowledge of diseases as obtainable from the pulse, and the latter as injurious to constitutions of the natives of the country. No. 4 is the infant disease curer, who is closely allied to the common practitioner, but who has picked up a few English drugs in ordinary use and added them with advantage to his stock of native medicines. No. 5 represents the pretender, who advertises and sets up a great and pretentious display after the manner of European quacks. These five comprehend the Hindu system of practice, and are classed respec-ively Raja Vaidya, Vaidya Raja, Vaidya, Bal Vaidya and Dhongi Vaidya.

Then comes a modification of Hindu medicine, used by a class of practitioners ranking No. 6 in the order given by this writer, and called Hakeem (literally a philosopher). They follow the Greek system of medicine, and their medical literature is to be found in the Arabic and Persian languages. With them anatomy and physiology is not studied, as the Mahomedan religion objects to dissection of dead bodies. Their medicines are chiefly of vegetable origin, and poisonous drugs and metallic preparations, though mentioned, are not practically used, but in special cases lettuce, hyoscyamus and opium in small doses are used by some of them. They act on the principle of elimination, depression and stimulation in the treatment of diseases. They have a number of electuaries possessed of tonic and aphrodisiac properties, in the composition of which amber, ambergris, castor and musk enter largely. They also have their charlatans, who are called (No. 7) Waleying Hakeems.

These practitioners, be they Vaidya or Hakeems, sends their prescriptions to the (No. 8) Gandhee or drug vender, in the bazar, whose name taken literally signifies a seller of odoriferous substances. He, like some of his kind in other countries, sometimes, by frequently going over the list of drugs sent to him for dispensing, and questioning the bearers as to the nature of the complaints, becomes a practitioner himself, and is then (No. 9) the Gandhee practitioner.

According to this account of them they mnst be arrant rogues, for they deal in European drugs, by ordering the refuse of European produce and then adulterating it as much as possible to augment their profits.

The quack specialists form a large and curious class in this account, and fou individuals receive special mention, viz.: 1. The pile and fistula curer. 2. The ophthalmologist. 3. The dentist, and 4. the bone-setter. Piles are cured by the arsenical paste, and fistulæ are relieved by passing a silk thread through them, which has been besmeared with the same paste, and letting it cut its way out. The ophthalmologist pares thin films from leucomatous opacities of the cornea, and couches for cateract. The dentist knocks off by gentle hammering all loose and painful teeth, binds teeth with gold and silver wire, and inserts artificial teeth made of ivory, bone or conchshell. The bone-setter is the type of the old barber-surgeon. He cuts for stone by the median incision, extracts the dead fœtus by piecemeal, bleeds, cups and extracts the guinea worm. His wife is the ordinary midwife, who, in addition, does the work of a menial. He sets bones and shampoos sprained joints; from incautious and light bandaging gangrene of the injured parts has not unfrequently resulted.

An interesting class is that of the itinerant drug vendors; then comes alchemist, a religious person, whose medicines are costly and who cures loss of virility, barrenness, etc., and finally the Makoor, or dweller in the hills, possessed of marvellous secrets, whose patients come to him for relief.

The European practice of medicine first came to India through the advent of the Portuguese. It comprises the qualified practitioners, including Europeans and natives, and the field of action is being overcrowded through the increase in numbers by fresh yearly accessions from European and local universities. The unqualified practitioner, who has not passed his final examination, but practices on equal terms with his qualified brethren, except in his inability to grant certificates. Then come quacks and charlatans. As to homœopathy, a regnlar student practicing in Bombay is not to be seen at the present moment. A European foreigner practicing this system now and then puts in his appearance, and after a short time disappears. Quack followers have, however, established themselves, one of whom, a partner in a native firm of merchants, is a much boasted practitioner. He also practices mesmerism under the initiation of the American theosophists, and is said to heal dozens of people daily before he leaves for his regular work.

There is an association of vaidyas, chiefly composed of members described under classes 3, 4 and 5, and is called "A Society for the Investigation of Medicine as obtained from the Veda."

SURGERY.

AN IMPROVED METHOD OF ADAPTING A TRUSS IN ALL FORMS OF HERNIA.—Thomas Bryant, F.R.C.S., in the *British Medical Journal* gives his views on the treatment of supposed irreducible hernia, as being that all herniæ, except those that have been subject to some antecedent strangulation, incarceration or obstruction, can be rendered reducible by treatment.

The means adopted to bring about this result are not complicated. They are the recumbent position, associated with limited diet, milk diet being the best, and the administration of small and repeated doses of saline purgatives, together with the local application of cold to the hernial protrusion by means of an ice-bag, or one of Leister's metallic coils. By these means the bowels are emptied of their contents, and the blood-vessels in their walls are rendered less turgid. The fat that may be in the omentum is likewise absorbed. This treatment, to be effectual, should be persisted in for days, and in some cases for weeks, and under it a good result may, with some confidence, be anticipated. Mr. Bryant, by this treatment, has succeeded, in from a few days to nine weeks, in reducing herniæ which had been down from five up to twelve weeks.

But it is his adaptation of a truss to the irreducible hernia that is particularly of interest. Having rendered the hernia as small as possible by rest, diet and the local application of cold, he takes a plaster of Paris "mould" of this hernia and the parts around its neck, and from this mould makes a "cast." Upon this cast a metal plate of tin or copper is moulded and covered with wash-leather, and when this has been efficiently made, as a result there is a pad which accurately fits the hernia, whether umbilical, femoral or inguinal, and this pad has only to be fixed to a spring or belt to make the instrument complete.

The pad, being a mould of the hernia, forms a most efficient protection to it; and touching, as it does, every point of the protrusion, it fairly guarantees no increase in its size; from like reason, the truss keeps its place, and is really comfortable to the wearer, since it presses equally. There is a little knack in taking this cast; all the hairs likely to be in the way must be snipped off, the tumor oiled, and dentists' plaster used by preference, as the commoner kind cracks and makes a mess. When plaster is not at hand for the mould, a piece of gutta-percha, dipped into hot water and softened, may be used for the purpose; and it is possible that this method may prove the most useful, since a hard mould is secured by this method, which is not likely to break.

CARDIAC TONICS, CAFFEINE AND CONVALLARIA MAJALIS.—Dr. Beverly Robinson (*Therapeutic Gazette*, August 15; 1883) advances the claims of the above drugs, substantially as follows: 1. The diuretic action of caffeine is more marked than that of convallaria; digitalis is more powerful than either. 2. Convallaria is well borne by the stomach in the case of those suffering from chronic cardiac disorder, unless the uræmic condition has already commenced. 3. Cardiac power is increased by both drugs, but digitalis is more efficient than either. 4. Digitalis, for restoring the rhythm, is more certain than either caffeine or convallaria, and cumulative effects do not appear where the latter are continued for ten days or more.—*Bulletin.*

THE

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PUBLISHED WEEKLY.

THE EDITOR of this JOURNAL would be glad to receive any items of general interest in regard to local events, or matters that it is desirable to call to the attention of the profession. Letters written for publication or containing items of information, should be accompanied by the writer's full name and address, although not necessarily to be published. All communications in regard to editorial work should be addressed to the Editor

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SATURDAY, APRIL 12, 1884.

HOW TO BECOME A MEMBER OF THE AMERICAN MEDICAL ASSOCIATION.—We are again asked by subscribers who are not members of the Association, to state clearly how membership is to be obtained. We answer, that the chief and most desirable method is to first become a member of a regular medical society, if one exists, in the city or county where you live. If no city or county society exists in your county then go to the State Medical Society of your State and become a member of it. All State and local medical societies which have adopted or approved the Code of Ethics of the American Medical Association, are entitled to send *one delegate for every ten* of their regular members. It is easy for any member who will promise to attend a given meeting of the Association to get appointed as one of the delegates from the local or State society to which he may belong.

Having such appointment and a certificate of the fact from the secretary of the society he must actually attend an annual meeting of the National Association, present his certificate to the Registration Committee, sign the Regulations, pay the membership fee of $5, and be registered as a delegate. Having thus acquired membership by serving at one meeting as a delegate, he remains a *permanent member* so long as he pays into the treasury the *annual* membership fee and complies with the rules of the Association, and is entitled to receive the journal of the Association without any further charge. But if he neglects to pay his annual membership fee for three successive years he forfeits his membership. It was designed by the foregoing plan, first, to encourage the organization and maintenance of local and State medical societies, and second, to make the National Association, primarily, a true representative organization, uniting and harmonizing the society organizations of the profession in all the States and Territories of our country.

The only other mode of obtaining membership, is by attending an annual meeting of the Association, and, through the endorsement and recommendation of the Committee of Arrangements, obtaining an election by *unanimous* vote of the Association. The number admitted in this manner, by unanimous vote, is very small.

COLLECTIVE INVESTIGATION OF DISEASE.—At the last meeting of the National Association, a communication was presented from the committee of the British Medical Association, inviting the coöperation of the American Association in instituting parallel lines of investigation in this country. The subject was more fully explained, and a sample of the memoranda and blank cards used by the committee of the British Association, in the seventh number of Vol. 1 of this journal, August 25, 1883, pp. 216, 217, 218. The communication presented at the last meeting was referred to the standing committee on "Meteorological Conditions of the Atmosphere, and their Relations to the Prevalence of Acute Diseases," with instructions to report at the next meeting of the Association. That committee consists of Drs. N. S. Davis, of Chicago; J. M. Toner, of Washington; H. O. Marcy, of Boston; W. H. Geddings, of Aiken, S. C.; S. M. Bemis, of New Orleans; and H. D. Didima, of Syracuse, N. Y. The chairman of the committee requests each member to communicate to him, as early as possible, such views as he may entertain in regard to the report which should be made to the Association at the meeting now near at hand.

THE MEETING OF THE ASSOCIATION AND RAILROADS.—The Committee of Arrangements at Washington are completing terms with all railroads entering Washington for reduced fare for members who wish to attend the next meeting. For particular information on the subject, apply to Dr. D. W. Prentiss, of Washington, D. C.

PARTIES who wish for space for the exhibition of drugs, chemicals, instruments, etc. etc., should apply to Dr. D. C. Patterson, 919 I street, Washington, D. C.

SOCIETY PROCEEDINGS.

SUFFOLK DISTRICT MEDICAL SOCIETY.

SECTION FOR CLINICAL MEDICINE, PATHOLOGY, AND HYGIENE. ALBERT N. BLODGETT, M.D., SECRETARY.

(*Concluded from last week.*)

Dr. Ayer also asked, "Is the milk injured by churning, or motion, in transportation? My impression has been that the carriage and disturbance were injurious."

The gentleman replied that the printed rules of the Milk Association, posted in the barn or on the premises of the farmer, require every milk can to be full up to the stopper, so as to prevent all churning. It is also required that the cow's bag shall be washed or brushed before milking. The milk should be cooled in another building from that in which the milking is done, and should be kept in the stall no longer than absolutely necessary after being drawn from the cow. The cars used for the transportation of milk are placed on regular passenger trucks, and ride as easy as passenger cars. The motion of the car does not affect the milk at all. The wagons used for delivering the milk after it arrives in Boston are made for that especial purpose, and are set on two springs, and have a peculiar rolling motion which does not shake the milk. With all the care which can be exercised, the milk is injured far more in being carried about for distribution in the milk wagons after it arrives in Boston than it is in being carried thirty, or even forty miles by rail. Even if delivered in the best possible condition, careless treatment after it is in the consumer's house will spoil it in half an hour. Often it is placed where the temperature is raised to 60° or 70° F., when it at once sours, and the consumer blames the milkman.

Dr. Barnes asked if it is possible to preserve milk in good condition for seventy-two hours? to which it was replied that this was perfectly possible. A certain lot of milk was on one occasion missent, and for nearly a week was lost. When recovered the milk was in perfectly good condition in every way. The firm which the speaker represents, not milk contractors but milk dealers, supplies the line of steamships plying between Boston and Norfolk, Va. These steamers always take milk from here the round trip, as no supply can be depended upon in Norfolk. On their arrival in Boston after the trip to Norfolk the milk which is left over is always found fresh and sweet.

Dr. Buckingham stated that the quality of milk is often materially affected by circumstances entirely independent of the age of the milk or its transportation. As a matter of fact the inside of milk cans is sometimes foul, and the corks sour. One way of preventing this would be the use of glass, as proposed by Dr. Morris. By this system, however, one would get the milk of only one cow in a glass, which would be objectionable. The expense of this course, which might be important, is a matter of which he knew nothing.

Condensed milk having been brought into the discussion, he thought that the Swiss condensed milk, the only one ot which he has knowledge, contains a great deal too much sugar to be a fit food for babies or invalids.

In answer to a question about the opinion of the Society as to the value of one cow's milk for babies, Dr. Buckingham said that the theory in giving one cow's milk is to avoid variation in the quality of the food. Milk from one cow does, however, vary somewhat from day to day, and it is probable that the mixture of the milk of several cows will vary less than that of any one of them. This he knew to be the opinion of several members of the Society. It is also the view that is gaining ground in Germany.

Dr. Harlow asked how many of the farmers probably adulterated milk to any extent or in any way before sending it to the city.

In reply it was stated that such a thing was very rarely done. Probably not over two per cent. of the farmers attempt to tamper with milk in any way. It would be fatal to their interests to do so, as the milk from such dairies would not be accepted by the contractor nor allowed to go out. The principal adulterators are a set of dealers who supply milk for a minimum price, and in this way build up a large trade in order to sell out. A well established milk route has a considerable commercial value. Unscrupulous men often build up a business in this way, and then sell the route to other parties.

Dr. E. T. Eastman stated that housekeepers often accuse the milkman unjustly. In a case known to him the servant was in the habit of taking off a portion from the top of the can, and supplying the deficiency with water, and the housekeeper complained that the milkman was delivering adulterated milk. This source of deterioration in the milk supplied to families is often forgotten, and the milkman is charged with adulteration.

In reply to the question how the supply of *cream* is obtained which is sold for table use at an advanced price, it was stated that the surplus of each day's milk was passed through a machine called the "separator," which removes the cream and leaves a pure skimmed milk which is sold to bakers, to families for domestic use, and for feeding to pigs. Another method of obtaining cream is also regularly followed. Each day cans of milk fresh from the dairy are poured into large receivers which are surrounded with ice, and are left undisturbed for twenty-two hours. At the end of this time it is skimmed with a conical skimmer, and about ten per cent. of cream obtained, which is the average amount in good milk.

Dr. Edes asked how the milkmen are sure of the quality of milk which they supply to their customers.

The reply was made that the quality of the milk is examined each day, and sometimes a favorite dairy will be found unfit for use, and will be rejected, and a supply from some other source obtained in its place. Suspicion was recently aroused in respect to a dairy, and on "setting" the milk it was found to

yield only six per cent. of cream. The milk from a neighboring dairy was also "set," and yielded fifteen per cent. of cream. Consumers would hardly have been satisfied if this milk had been delivered to them in glass jars sealed in the country, though they could not then accuse the milkman of tampering with it. Often the milk from a reliable dairy will be found sour, and, of course, must be rejected, and used for butter. The quality of the milk also depends on the food of the cow. Brewers' grains are not considered an unhealthy nutriment for cows, but the milk is thin and white.

In reply to a question by Dr. White as to how many cows are represented in one can of milk, it was stated that rarely would one can contain the milk of more than two cows. The farmer milks the cows in succession, and as soon as each cow is milked the milk is strained into the cans, which are successively filled and at once placed in water to cool. After arriving in the city the milk is mixed, and is then drawn into the service cans for distribution.

Dr. Bundy said that he had witnessed the operation of "mixing," and had seen water added in considerable quantities previous to filling the service cans for families.

Dr. Davenport asked if the milkmen consider the required standard too high? The reply was made that the milkmen in general know nothing about the standard, and but little about milk regulations or milk laws, but studiously endeavor to avoid the penalties.

The statement has been made that the cream sold by milkmen was obtained from creameries, as it was impossible to obtain good cream from the tops of their cans. Mr. Abbott stated that in his earlier experience as a milkman he found no difficulty in getting a large share of the cream, the motion of the cars was so slight, and the sudden cooling with ice caused the cream to rise so that most of the cans have a heavy cream on them when reaching the city. Those that did not could be iced and kept over, as nearly every milkman carries a surplus.

Dr. Barnes stated that the Milk Inspector, in speaking of the arduous duties of his office, said that if the city would furnish him with a team he could accomplish much more. Mr. Abbott produced the Milk Inspector's report for the year ending March 21, 1883, showing that the number of visits made and samples inspected was 1,153, or, allowing 300 working days, would be less than four per day, which Mr. Abbott thought, with our system of horse cars and good sidewalks, would not be a very laborious work for an able-bodied man. Our Milk Inspector receives $1,800 per year, and has a clerk at $500, making $2,300; divide this by 1,153, and it will be seen that it costs the city of Boston nearly $2 apiece for every sample of milk inspected. To this must be added $140 for analysis in fourteen cases, as a result of which thirteen persons were prosecuted and twelve convicted. In looking further, we find that at that date 860 store-keepers or retail dealers have been licensed. Is it possible that only that number of store-keepers in Boston have heard that there is a milk law? Such being the case, it is not to be wondered that the milk-dealers speak with contempt of the Milk Inspector and his office.

Dr. Marcy remarked that we should not forget that in the plan for furnishing milk as described and practiced by Dr. Morris, all chances of contamination of the milk from dirty vessels, all manipulation by middlemen, and all abstraction by servants after the milk has been delivered is prevented. The most of the objections urged against milk as now supplied, would at once be removed There seems to be no good reason why a plan which can be carried on in Philadelphia to the satisfaction of the consumer, and at a fair profit to the projector, might not work equally well in Boston.

Dr. Blodgett remarked that a part of the responsibility for adulterated milk undoubtedly rests upon the people consuming it. Very few people in the city know how pure milk looks, and expect a rich yellow milk at all times of the year and under all circumstances. Cow's milk is not all yellow, nor is it always yellow. The farmers endeavor to secure cows which will yield large amounts of milk, but the color is often very pale. The farmer gets three and a quarter cents a quart for milk, and he tries to get the largest possible amount from the cows. A farmer cannot furnish Jersey milk for three and a quarter cents per quart. If people demand a quality in milk which does not belong to it there are no doubt many milkmen who are willing to furnish it of any desired color; and thus the consumer unconsciously encourages adulteration.

Dr. Blodgett further stated that he had made some attempts to ascertain the methods employed in the handling of milk, and that he had seen and heard much which was new and interesting to him, and was particularly struck by the courtesy and freedom with which he had invariably been allowed to make any investigations or pursue any inquiries he thought desirable. He thought that the members of the Section would be favorably impressed with the care and scrupulous attention to cleanliness which are observed in all the operations to which milk is subjected in transit and until it is delivered to the milkmen for distribution. Of course all this does not in any way prevent these persons from adulterating it before they deliver it. But there seems to be no systematic adulteration, as we have too often been led to suppose. A visit to the large milk depots is calculated to inspire a greater degree of confidence in the quality of the milk supply than exists at present in the minds of the majority of consumers.

Dr. H. I. Bowditch then presented the following resolution:

Resolved, That the chairman be requested to appoint a committee of five, whose duty shall be to report upon the whole subject of the providing of milk for Boston, and suggest the means for obtaining it pure for the citizens.

The resolution was unanimously passed, and in accordance with its requirements the following committee was appointed: Dr. H. O. Marcy, chairman, Dr. A. N. Blodgett, Dr. E. W. Cushing, Dr. H. J. Barnes, Mr. L. F. Abbott.

On motion of Dr. Blodgett, the thanks of the Sec-

tion were tendered to the members of the Milk Producers Association for the important information which they have placed at the disposal of the Section in regard to the source, treatment, and adulterations of the milk supplied to the citizens of Boston.

The second paper of the evening was entitled

THE MILK SUPPLY OF BOSTON, AND THE BENEFIT TO BE DERIVED FROM THE SPAYING OF COWS,

by Mr. Lloyd F. Abbott, a former milk producer and dealer. The paper was read by Dr. G. E. Mecuen, who described the process as follows:—

As regards the spaying of cows there is little danger if properly done, and the mortality should not exceed one per cent.

Operation. An incision is made in the flank of the cow, left side preferred, as being handier for the operator, about four inches long, through the skin, then the muscles and fascia are cut, and the peritonæum divided, using the finger as a director. The hand is then introduced and carried upwards and backwards until the uterus is reached, when, by following the horn outwards, we find the ovary, and remove it with the thumb-nail or écraseur; this can be held by the two last fingers of the hand, and search made for the other ovary, and when found removed in the same manner; when the arm and hand are withdrawn and the wound stitched by the interrupted suture passing through all tissues except the peritonæum. During the whole operation a 20 per cent. solution of carbolic acid is used with the steam atomizer, the hands and side of the animal being thoroughly washed in the same solution. The hair should be clipped from the flank before incision. The pain from the operation is slight, the cow struggling only during the cutting of the skin, which does not take more than two or three seconds, and again during the sewing at the end of the operation. The latter is the most difficult part of the whole operation, as cow-hide in its undressed condition is very tough. While the arm and hand are within the belly of the cow the animal really seems to enjoy it, acting as a dog does when one rubs his head.

The advantages from this operation are set forth in Mr. Abbott's paper, and I will merely call special attention to a few of the most important. First, the quantity at a milking is increased, and a great increase takes place in the yearly yield of a cow. As to the milk itself, its quality is improved, the fat and sugar are increased, and although I did not keep a record of the examination of specimens of milk from these spayed cows before and after the operations (examining only for my own information, not expecting to have occasion to refer to figures again), I think that, judging from the large number of milk analysis that have been made, I would be supported in claiming that where fat and sugar are increased casein is decreased. Now this milk will be of the same quality day after day, unless the cow has some acute disease, provided she is properly fed and attended to. If over-fed she is apt to fatten, and fall off in the quantity of milk, as a spayed cow, like any animal deprived of the reproductive organs, is quite easy to fatten, thus adding to her value as beef. By this operation all the danger of abortion, post-partum hæmorrage, accidents during heat, while with the bull, and calving are eliminated. The bad breeding and small cows may be made good milk-producers, and easily fattened for market. But I suppose the greatest advantage of all is the escape of the periodical change occurring in the milk of the unspayed cows every three or four weeks, and lasting a day or two.

Cows are extensively spayed in Texas when young, simply for the purpose of making good beef cattle, the butchers at Brighton abattoir being well aware of the fact. Before operating I visited the abattoir several times for the purpose of becoming acquainted with this anatomy of the cow, and an inquiry at the various slaughter-houses "if they were going to kill a cow" would receive the answer "yes." On the cow being opened I would find only a rudimentary uterus and no ovaries. After examining several I asked the butcher "where the ovaries were." He informed me that they had been removed when the animal was young, and showed me the scar in the hide. The way he had of finding it was that the tissues were all fused together, it requiring care to separate the hide, and the use of the knife, while only his hand was necessary in other parts. It seems to me that this is proof that the operation is a safe one, for the stock-raiser would not run the risk of losing young cattle just for the sake of increasing the weight of a few.

There are two facts which are of interest to us as physicians, namely, first, for two or three days after the operation the flow of milk is reduced to almost nothing. I suppose this is due to the congestion of the broad ligament and tubes. Second, in one case operated on, miscarriage followed ten days after the operation, the calf being macerated so that the hair and skin readily peeled off.

I was present at the spaying of five cows by a veterinary surgeon in which the operation was done through an incision in the posterior and lateral side of the vagina, the surgeon using a speculum to fix the uterus and distend the vagina, then cutting and introducing the hand with an écraseur, and having engaged the ovary, removing it and the other through the same opening, the result being left to nature. From the slight observation I have had as yet, I would favor the flank operation.

Dr. James R. Chadwick said: I was called upon by Mr. Abbott to operate for him in one of his early cases. I did not find that my previous experience with the human species was of any material aid in the operation upon cows. I can testify that the operation appeared to give the cow but little pain, and only during the incision through the integument and its subsequent suture. The cow seemed to be chiefly affected by alarm at having her head and legs securely bound with ropes, but this no more than equaled our fear lest she would break loose during the operation and strike out. I was surprised on making the incision through the flank to find all further progress apparently barred by one of the stomachs; the hand was, however, easily passed between this and the abdominal wall into the pelvis, where the two ovaries were successively seized and torn off by the thumb

nail. But slight hæmorrhage resulted. The only real difficulty of the operation was in perforating the hide with a needle to close the integumental incision. This is readily appreciated by considering the difficulty that would be experienced in trying to sew up a rent in a cowhide boot. Waring assured me last year that the effect of spaying cows had been of great benefit in promoting lactation, and that the mortality was no greater than five or six deaths in a thousand operations.

Dr. Gilbert, of Dorchester, who has also witnessed the operation, said that the cow seemed to suffer no great pain, excepting when the outside skin was being cut, and when the stitches were inserted, at the close of the operation. The risk and discomfort of ether are much greater than the pain of the operation.

Dr. Mecuen stated that one cow from which the ovaries were removed has produced milk continuously for eleven years, and in this entire period has fallen off only three pints. Dr. Brush claims that the amount of milk will remain the same during the life of the animal. The carbolic spray was employed in all cases except the first one. On opening the peritonæum the air rushes into the abdominal cavity, but seems to produce no injurious effects. Both ovaries are removed at once. No dressing other than some substance to protect from flies, etc., is necessary, and the wound is entirely healed by first intention in about a week. The animal should be kept on low diet for a day or two, but in three or four days is allowed to run in the pasture as usual. In one case the cow was five months pregnant. The operation produced a miscarriage at the end of ten days. The fruit was macerated. After spaying, the only condition which will cause the quantity or quality of the milk to undergo variation, is sickness of the animal.

Dr. E. W. Cushing stated that there is always an infant in his house. He has used the milk from a spayed cow for more than a year, and finds it to be a good product and of uniform quality. New milk (after calving) is not good for children, and the milk during menstruation is not wholesome for an infant. Cows and women are much alike in this respect. The milk taken from a pregnant cow is unwholesome for a delicate person, and no mother thinks of nursing her child after she has again become with child. Milk as we obtain it is often neither natural nor healthy, for no animal in a natural condition gives milk while she is carrying her young.

On motion of Dr. Marcy, a vote of thanks was tendered Mr. Abbott for his description of a safe operation, whereby the quality of milk supply may be materially improved and its quantity rendered constant for many years.

Adjourned at 11 o'clock.

OBSTETRICAL SOCIETY OF PHILADELPHIA.

Stated meeting, Thursday, April 3, 1884. The President, R. A. Cleemann, M.D., in the chair. Dr. Cleemann made some remarks on the subject of

DIGITAL DILATATION OF THE OS UTERI DURING LABOR.

He had been taught not to dilate or stretch the os uteri with the finger, and for years this early teaching deterred him from making any attempt to supplement the contractile powers of the uterus by assisting in the process of dilating the os. Some time since he was called to attend a primipara. The waters had been discharged the previous day. The pains had continued, but the os uteri was very small and the cervical rim hard and unyielding. He felt called upon to interfere actively, and tried to dilate the os with his finger. It softened rapidly, and in half an hour was sufficiently dilated to allow the head to pass, and delivery rapidly followed. Since that occasion he has tried the same procedure in several cases, and always with gratifying results, the labors being brought to rapid terminations where previously hours had been wasted in weary and painful waiting.

The irritable condition of the os which had been lectured upon as the consequence of such interference has not been experienced; no injury has resulted in any case. The soft finger can do no more harm, if clean, than a Barnes' or other form of dilator, and there is no danger, as in the case of the latter, of pushing the head aside and converting a vertex into a shoulder or other faulty presentation.

Dr. W. T. Taylor, since he had dared to deviate from the teaching of Professor Hodge, had used his finger to assist the dilatation of the os. He did not do so if the cervix was irritable or its edge wiry.

Dr. Githens had practiced digital dilatation of the os uteri throughout his obstetrical practice, a period of eighteen years. He does not confine it to any class of cases, nor does he wait until after the membranes are ruptured. In any or all cases he finds that a "pain" is accompanied by a contraction of the circular muscular fibers of the cervix, as well as by a contraction of the longitudinal fibers of the body of the uterus. The contraction of the circular fibers retards the progress of the labor. The intention of the digital distension is to paralyze these circular fibers and thus favor the dilatation of the os. In practice this effect is rapidly produced. One or two fingers are swept around the inside of the cervix, the pulp of the finger being next the cervix, and the latter is pulled away from the head. This operation is kept up during the interval between pains; when the pain occurs the finger is withdrawn, and the operation is repeated in the next interval. The membranes are not ruptured by this process. The irritable condition of the os, if such exists, is subdued. If the rim of the cervix is wiry and thin, or hard and thick, it softens and yields. The cervix and vagina, if hot and unyielding, at first become cool and pliant; cervical tears are almost entirely avoided, and the time, pain and exhaustion of the labor are reduced to a minimum. The process is useful in every case of labor throughout the first stage.

Dr. Philip M. Schiedt practices digital dilatation largely. His patients say they recognize the assistance it gives them, and in subsequent labors ask the

doctor to help them. By the great shortening of the first stage of labor resulting from this method the use of the forceps is frequently avoided.

Dr. Parvin would be sorry to see digital dilatation adopted as a rule for all cases. He thinks it shortens labor by increasing the uterine contractions, and not by dilating the os. Voluntary efforts at bearing down are not needed during the first stage; they are dangerous rather than helpful. The method may be useful in some cases after the rupture of the membranes, which is the natural dilating agent. There is also danger of septicæmia from germs on the fingers. He does not think the fingers so good a dilator as Barnes' dilator, because they do not press equally on all sides of the os, but only on one point at a time, and thus cause an unequal thinning with danger of laceration. He thought the danger of a change of presentation by the use of Barnes' dilator very slight. He would prefer a mechanical dilator to the finger whenever dilatation was necessary, but thought something ought to be left to nature. Any sort of interference carries a possibility of danger.

Dr. Elliott Richardson thought there was a possible danger of rupturing the membranes. Our authorities caution us about the introduction of the finger into the uterus, and the too early rupture of the membranes.

Dr. Harris remarked that one point had been overlooked. Why does the os not dilate easily when the head is the dilating agent? It is because it is a round surface over which the cervix does not slide easily. On the contrary, the finger is applied at successive points. One benefit of the method is that any change or danger is at once detected. The method should not be used indiscriminately, and we should not interfere unnecessarily.

Dr. Cleemann would not recommend the method in every case of labor. He has resorted to it in cases where there has been early rupture of the membranes, and the assistance of the bag of waters has been lost. In a recent case he had saved a patient hours of suffering, and the os was not bruised or injured in any way. The sight of any instrument causes the patient much anxiety, and the exhibition of the Barnes dilator, and the water, syringe, etc., cause nervous excitement. The bags sometimes burst, and thus give the patient a terrible shock, with the added discomfort of the escaping water or air. He has always carried them, but does not like to use them.

EXANTHEMATOUS DISORDERS IN THE PUERPERAL STATE.

Dr. Parvin had recently an experience of the invasion of measles and scarlet fever in the obstetric ward of the Philadelphia Hospital. In the first case in which measles occurred, he did not think that the full term of pregnancy had been reached. Authorities state that premature labor is usually caused, a result of the high temperature of the exanthematous fever. One patient had septicæmia in addition, but recovered. The infants were not affected. In one case, soon after labor, the temperature rose to 103°, and the patient was sent to the fever ward. At the second visit a slight rash was observed, which subsequently proved to be scarlatina. Desquamation was very abundant; albuminuria was very marked on the tenth day; rheumatic pains were also felt. The patient recovered. The child remained well. Children have been born with the measles, but he did not know of such an experience with scarlet fever.

Dr. W. T. Taylor, some 15 or 20 years ago, had reported in *American Journal Medical Sciences*, 1853, a case of congenital small-pox. The mother had some febrile symptoms and pain in the back, and the child had the disease, being marked with pits. He had a case of scarlet fever in a mother two days after labor. It proved fatal in two days. The child lived.

Dr. Harris remarked that in the reports of the Rotunda Maternity Hospital, in Dublin, are a number of interesting reports on complications of the puerperal period by exanthematous fevers. Their mortality has been very materially influenced by these epidemics. Erysipelas is the most interesting and most fatal of these complications. In some cases it resembles septic poisoning.

W. H. H. GITHENS,
Secretary.

FOREIGN CORRESPONDENCE.

LONDON, MARCH, 1884.

Some of your readers who have been present at the annual meetings of the British Medical Association, may have noticed Dr. Price, of South Wales, who considers himself the nineteenth century representative of the ancient Druids; he always dressed in green trousers and a sort of white smock coat, with a fox's skin by way of head covering. It appears cremation was the Druidical means of disposing of the dead. Some weeks ago the neighborhood of Dr. Price's residence was startled one evening by the reflection of a fire on a hill-top near. Upon closer investigation it appeared the doctor was engaged burning the body of his child in a cask of petroleum. After a scene of excitement the charred remains were rescued, and eventually the exponent of Druidism was arraigned before Lord Justice Stephen at the winter assizes at Cardiff. His lordship, after discussing at length the disposal of dead in ancient Europe, ruled that there was no law, old or modern, that rendered the burning of a body illegal, provided it be done in such a manner as to cause no nuisance. The ruling in this case will, no doubt, give impetus to those who are advocates of cremation in this island.

In the last report sent by the German cholera commission, who have gone from Egypt to Calcutta, it is stated Dr. Koch has really discovered a special cholera bacillus, and that he found the water supplied to some patients was teeming with bacilli identical with those found in cholera subjects. Professor Cohn, writing to one of our journals from Breslau, calls attention to the circumstance that just 200 years ago

there was made in the Netherlands a scientific discovery of the greatest importance. In the year 1683 Leeuwenhoek gave notice to our Royal Society that by the aid of his microscope he had detected in the white substance adhering to his teeth "very little animals moving in a very lively fashion." These, says Professor Cohn, were the first bacteria which the human eye ever saw. The descriptions and drawings given by this first observer are so correct, that the organisms drawn by the hand of Leeuwenhoek can be easily recognized and compared with their fellows of to-day.

Mr. Lennox Brown, F. R. C. S., has been investigating the latest idea of the "artificial Italian air" which was mentioned in a former letter. In an able paper read before the society for the encouragement of the fine arts, he declared that peroxide of hydrogen had not been shown to be beneficial; while of the two ingredients with which it was mixed, ammonia was a most poisonous gas, and peppermint was useless. Mr. Brown earnestly advised those who were vocalists not to try the idea with a view of strengthening and improving their voices until more was known of its merits. A statement has just been published showing the deaths which occurred from the use of anæsthetics in surgical operations during last year in the United Kingdom. Only nine are reported to have occurred from this cause in 1883, the number in 1882 having been twenty-eight, and in 1881 fifteen. In many of these cases the fatal result may fairly be considered to be due not to the anæsthetic, but to the operation. In Leeds chloroform was used in over nine thousand cases without a single mischance. With regard to nitrous oxide, it may be said that the risk from it was almost *nil*, for a series of more than twenty thousand operations are recorded in which there was not a single untoward result. One death was caused by it in the Dental Hospital, Leicester Square, in a case where the patient had a serious complication of diseases. It is however, to be feared that the growing practice, especially among dentists, of administering it single handed, will be productive of mischief. It is suggested that the theory and practice of anæsthetics should be more thoroughly taught in our medical schools, and that as a special certificate is given by an expert to qualify a medical practitioner for performing the very simple operation of vaccination, it might be as well to apply at least an equal test to the student's knowledge of sending his patient into a state of insensibility.

A deputation of medical men have just waited upon the Bradford School Board and presented a memorial signed by most of the doctors of the town, praying the board to dispense with "home lessons" so far as regards children under ten years of age. Dr. Rabaglish said that the returns of the Register-General showed the extraordinary fact that since the Compulsory Education Act came into force, the deaths from cerebral effusion amongst children of school age had increased by 20 per cent., and from inflammation of the brain by 50 per cent.

At the Cambridge Medical Society a case was shown of division of the median and ulnar nerves treated by sutures. The wound, which was rather lacerated, divided the ulnar artery, the superficial flexor tendons, and the ulnar and median nerves—the former was tied; the nerves were sutured with fine catgut. On the fourth day after the operation sensation returned in the parts supplied by the injured nerves, and though the wound did badly, and there was both great constitutional disturbance and diffuse cellular inflammation of the fore-arm, yet the union of the nerves never seemed to be disturbed. The patient was produced, and it was seen there was some wasting of the muscles of the thumb, and contraction of the fingers, but that sensation was perfect. The patient could tell which finger was touched, and what part of it. The only inconvenience he experienced was a curious sensation of numbness in parts supplied by median nerve, which was most apparent in cold weather, and on one occasion he suffered from a bullous eruption on the index finger, having incautiously exposed it to the cold.

The London Medical Society had an interesting paper read by Dr. W. H. Corfield upon the diseases resulting from the pollution of the air through defective house sanitation. He considered the fault was more frequently due to dishonest workmanship than faulty design. The chief sources of danger were the common ones of direct communication with the main drain. He mentioned cases where foul air had been conducted from the basement all over a house by means of the bell wires. Enteric fever he looked upon as usually caused by drinking foul water, rarely by inhaling foul air. Diphtheria, however, was caused most frequently by breathing foul air. G. O. M.

SPECIAL NOTICES.

TO THE MEMBERS OF THE AMERICAN MEDICAL ASSOCIATION WHO LIMIT THEIR PRACTICE TO DISEASES OF THE EYE, EAR AND THROAT:

The Secretary of the Section of Ophthalmology, Otology and Laryngology desires to say that owing to a misunderstanding of his duties, no invitations have been sent to any member of the profession to prepare papers for the coming meeting of the Association on the above-named diseases.

He now most earnestly solicits voluntary productions and hopes that all who see this notice, and have the success of this Section at heart will consider themselves personally appealed to. It may possibly be urged that the time is too short. On the contrary it is ample. Please send in the titles of papers now, and write up the subjects afterwards. If the gentlemen to whom this is addressed will kindly take the matter in hand one of the most successful meetings ever experienced will be the result. Prolixity (the bane of nearly all medical societies) will necessarily be avoided, and instead of fancying ourselves in the halls of Somnus, we shall be actively engaged in the elysian realms of the most delightful discussions known to the profession since the foundation of this Association.

Do send in the titles of papers, we beg of you, and make this seeming defeat (caused by your secretary's misunderstanding) a glorious victory. No one, or two, or three dozen are invited to the exclusion of others, but all. Let it not be a failure.

Please send the titles to Dr. J. L. Thompson, 22 W. Ohio street, Indianapolis, or to Dr. D. W. Prentiss, Washington, D. C.

J. L. THOMPSON,
Indianapolis.

THE ASSOCIATION OF AMERICAN MEDICAL EDITORS.
ANNUAL MEETING, WASHINGTON, D. C., MAY 5, 1884.

The annual meeting of the Association of American Medical Editors will be held in Washington, May 5, at 8 P. M., in Medical Hall, southeast corner of Sixth and F streets.

The annual address will be delivered by President Leartus Connor, M.D., on "The American Medical Journal of the Future, as Indicated by the History of American Medical Journals in the Past."

Dr. N. S. Davis will open the discussion on "How far can Legislation Aid in Elevating the Standard of Medical Education in this Country?" In which Dr. A. B. Palmer, Dr. Henry O. Marcy, Dr. L. S. McMurtry, Dr. C. H. Hughes, Dr. Frank Woodbury, Dr. William Brodie, Dr. A. N. Bell, Dr. Wm. B. Atkinson, Dr. W. C. Wile, Dr. W. R. D. Blackwood, Dr. Henry Leffmann and Dr. Deering J. Roberts will take part.

All members of the profession, especially journalists and authors, are invited to be present and take part in the meeting.

JOHN V. SHOEMAKER, Secretary.
Philadelphia, 1031 Walnut street.

STATE MEDICAL SOCIETY OF ARKANSAS.

DEAR DOCTOR:

The ninth annual session will be held at Little Rock, on Wednesday, April 30, Thursday, May 1, and Friday, May 2, 1884, commencing at 10 A. M. on Wednesday.

You are earnestly urged to be present and to induce others to join with us in the work of advancing legitimate medicine.

Each county or municipal society shall be entitled to one delegate for every five members, and one for a fraction over five.

"The several committees shall report annually, through their Chairman, respectively, upon the specific subjects to which they have been appointed. It shall be the duty of each committee to make a full and complete report to the society of all matters, business, etc., that properly comes before or presents itself to them upon each particular branch or section." Art. IX., Sec. 2, Constitution.

L. P. GIBSON, M.D., Secretary.
Little Rock, March 20, 1884.

POLITZER treats aural polypi by instilling alcohol several times daily. It must be warm, and shrinking occurs in a few weeks.—*Wiener Med. Blatter.*

MISCELLANEOUS.

LIST OF CHANGES IN THE MEDICAL CORPS OF THE NAVY, DURING THE WEEK ENDING APRIL 5, 1884.

Medical Director P. S. Wales, granted one year's leave of absence from March 28, with permission to leave United States.

Medical Inspector N. L. Bates, ordered to Washington to attend sick officers.

Medical Inspector M. Bradley, ordered to continue duty at League Island Navy Yard.

Assistant Surgeon H. W. Whitaker, ordered to naval rendezvous at Philadelphia, Pa.

Surgeon-General F. M. Gunnell, appointed Chief of Bureau of Medicine and Surgery and Surgeon-General of the Navy, with the relative rank of Commodore, from March 27.

P. A. Surgeon C. W. Rush, ordered to Naval Academy.

Surgeon D. McMurtrie, detached from naval rendezvous, Philadelphia, and to await orders for duty at Navy Yard, Washington, D. C.

Medical Inspector H. C. Nelson, ordered before Retiring Board.

Medical Inspector A. C Gorgas, to be Medical Director from the 4th March, on the active list.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT UNITED STATES ARMY, FROM MARCH 29, 1884, TO APRIL 4, 1884.

Mearns, Edgar A., First Lieutenant and Assistant Surgeon, assigned to duty at Fort Verde, A. T. (Par. 1, S O. 22, Headquarters Department of Arizona, March 19, 1884.)

White, Robert H., Captain and Assistant Surgeon, to be relieved from duty at U. S. Military Academy, West Point, N Y., Aug. 28, 1884. (Par. 7, S. O. 74, A. G. O., March 31, 1884.)

Woodhull, Alfred A., Major and Surgeon, granted leave of absence for twenty-two days, to take effect about April 6, 1884. (Par. 13, S. O. 72, A. G. O., March 28, 1884.)

NEW BOOKS.

Rothe, C. G. Die Diphtherie. Ihre Entstehung, Verhütung u. Behandlung. 8vo. 90 pp. Leipzig: Abel.

Rüdinger, N. Zur Anatomie der Prostata d. Uterus masculinus u. d. Ductus ejaculatorii Beim Menschen. Mit 3 Tafl. in Farbendr. 8vo 23 pp. München: Rieger.

Schech, Ph. Die Erkrankungen der Nebenhöhlen der Nase u. ihre Behandlung. 8vo. 19 pp. München: Rieger.

Stintzina, Roderich. Beitrag zur Anwendung des Arsenicks bei chronischen Lungenleiden, insbesondere bei der Lungentuberkulose. 8vo. 29 pp. München: Rieger.

Voit, Carl. Ueber die Ursachen der Fettablagerung im Thierkörper. 8vo. 23 pp. München: Rieger.

Wachsmuth, G. F. Diphtheritis. 4 Auflg. 8vo. 26 pp. Leipzig: Urban.

Weismann, Aug. Ueb. Leben u. Tod. Eine biblogr. Untersuchg. Mit 2 holzchmitten. 8vo. iv. 85 pp. Jena: Fischer.

Wertheimher, Aug. Zur Behandlung der Eklampsia infantum. 8vo. 17 pp. München: Rieger.

Wölfler, Ant. Ueb. die Entwickelung u. den Band kropfes. Mit 19 lith. Taf. 8vo. 210 pp. Berlin: Hirschwald.

Croom, J. H. A Study of the Bladder during Parturition. 4to. 70 pp. London: Hamilton. 6s.

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Place of meeting, 1884, Washington, D. C.; Time of holding meeting, first Tuesday in May.

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"Diseases of Children."

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"Oral and Dental Surgery."

Chairman—Dr. T. W. Brophy, Chicago, Ill.; Secretary—John S. Marshall, Chicago, Ill.

"State Medicine."

Chairman—Dr. Deering J. Roberts, Nashville, Tenn.;
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